

BITS

computing & communications news

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COMPUTING, INFORMATION, AND COMMUNICATIONS (CIC) DIVISION • LOS ALAMOS NATIONAL LABORATORY



The New Mexico Supercomputing Challenge is an academic-year project in which teams of one to five high-school students and their sponsoring teachers conduct computational science projects using high-performance computers. Each team receives an account on a Cray supercomputer at Los Alamos and an account on New Mexico Technet to access the state network and the Internet. The Challenge, now in its sixth year, fosters creativity in devising computational solutions to scientific problems and motivates students to prepare for the work force of the future. The picture (left) was chosen as this year's logo at the Award's Day Ceremony at Los Alamos in April 1995. Students from Kirtland Central High School in Farmington, New Mexico created the picture.

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CIC Customer Service Center (505) 665-4444 or cichelp@lanl.gov

Integrated Computing Network (ICN)

Consulting:

Centralized scientific and engineering computingconsult@lanl.gov or 7-5746
Lab-wide administrative and business systemslabwide@lanl.gov or 7-9444
Passwords (required for access to ICN)validate@lanl.gov or 5-1805
Systems documentation (local and vendor supplied).....7-6992

Central Computing Facility (CCF)7-4584

Advanced Computing Laboratory (ACL)5-4530

Desktop Support Center (DSC)7-4357 (7-HELP)

(PC Help for IBM and Macintosh personal computers)

For questions about PC software: PCSW-help@lanl.gov or 7-5884

For questions about PC hardware: PCHW-help@lanl.gov or 7-9372

For Macintosh questions: Mac-help@lanl.gov or 5-1361

For UNIX questions: UNIX-help@lanl.gov or 5-0433

For groups with CIC-2 support contracts: 5-2220

Telephone Services Center7-3400

(includes voice mail)

Computer training

Lab-wide systems support training7-9444

Computer/workstation training7-9399

Personal computer training7-9071

Microcomputer support facility seminars7-4357

(Macintosh/IBM software, lending library)

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New Computer Programs Automate Test Development and Scoring



Employees taking a test for Radiation Worker II training will know their scores before they leave the Training Office, thanks to an automated test-scoring program written by CIC-12's Mike Belcher.

"From the choices below, select the one that best answers each question and, using a number 2 pencil, fill in the space next to the letter of the correct answer on the answer sheet"—familiar words if you've ever taken a machine-scored test. Computer programming is the basis for machines' ability to score such tests and now, in LANL's Human Resources Division (HR), for the development of the tests themselves.

Programmer Mike Belcher (Applications Programming Group, CIC-12) has worked with the Testing and Evaluation Team in HR's Training and Development (T&D) Group to provide a database for test questions, an automatic way to devise tests so that no two are alike, a test-scoring function, and a system that is easy to customize to generate the desired reports. These tools are presently in use for Radiation Worker and Radiation Control Technician courses and for General Employee Training. In total the courses have some 1,299 questions. Belcher has created a database for all the questions and databases for answers in each of the tests. The tools were developed using Microsoft's Visual Basic language as a base in conjunction with Microsoft Access.

The system took about eight months to develop and is now being used by the Testing and Evaluation Team to design and score tests. The test administrator enters the class title, the module, the number of questions desired, the objectives, the number of questions per objective, and the number of right answers needed to pass the test. The questions database automatically selects appropriate questions. When the month and day are entered, these questions compose a unique version of

the test, and they may be shuffled and reordered automatically when another version is called for.

After taking the test, a trainee brings the answer sheets to the test administrator, who uses Belcher's program to score the test. While the trainee waits, the scanner scans the form and automatically exports it to the computer; the computer prints out a scoring key, validates Z-numbers and names, scores the test, and prints out a feedback report for the trainee. This report gives the score and the pass-or-fail determination and lists the training objective of any question missed, along with the page in the manual that covers that material. If an error is found, for instance if there's an incomplete erasure, a question mark shows up on the screen immediately so that the test administrator can determine what the trainee actually marked and rescore the test. This test-scoring procedure allows trainees to return to work; they don't have to wait for the entire class to finish the test, and they don't have to call in for their scores.

Belcher has shown the Testing and Evaluation Team members how to use the system to generate customized reports, for example, how well students tend to do on a particular course module or how hard a particular question is relative to others. In July T&D started using the automated system, which has made it possible for team members to spend much less time on devising and scoring tests. Trainees, whose job responsibilities may include handling and storing radioactive materials, can be assured that the tests provide important feedback on any area of the course content they might not have remembered.

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HPD: Heterogeneous Parallel Debugger

This article will focus on HPD (Heterogeneous Parallel Debugger), a debugger for parallel programs. HPD provides debugging support for parallel programs written via explicit message passing (Parallel Virtual Machine (PVM) 3.3) and data parallel paradigm (Portland Group, Inc. High Performance Fortran (PGI HPF)). PVM 3.3 is a message passing library exported from the distributed-tools machine (alias beta) here at LANL. The Parallel and Distributed Tools Team (ptools team), which operates within the Distributed Computing Group (CIC-8), provides technical support for PVM on HPUX, SunOS, Solaris, AIX, and IRIX operating systems. HPD is available for early testing by LANL users who use SUN workstations. HPD is being developed by the ptools team in collaboration with NASA, Ames Research Center, and Portland Group, Inc. Support for HPD is provided by the ptools team (ptools_team@lanl.gov).

Parallel Debugging

Knowledge of certain parallel program characteristics will help parallel programmers to be more prepared when disaster strikes. Because of these characteristics, parallel program debugging tools are required to adopt significantly different strategies than those required for sequential program debugging tools. For a more detailed description of these characteristics, please refer to the article "PVM 3.3 Development Toolbox," which is in the March 1995 issue of BITS. By the time HPD is completed, it will address most of the issues that arise from these characteristics. Currently, a preliminary version of HPD is being tested by a limited number of LANL users.

HPD Development

The discrepancies between the needs of LANL users and what is available in vendor supplied debuggers convinced those of us within the ptools team that a portable and heterogeneous parallel debugger is necessary. In particular, the development of HPD is motivated by the following requirements.

The same look and feel on different machines: Currently, every workstation vendor has a different debugger, even though dbx is the common denominator for most debuggers. Massively Parallel Processors (MPPs) also have different debuggers. The different user interfaces and different capabilities that these debuggers provide make it difficult for users to switch from one debugger to another. HPD will provide the same interface across a greater variety of machines.

Support for debugging programs that execute over heterogeneous machines: PVM provides users with the capability to run a program across a heterogeneous mix of machines. However, users do not have a debugger that works on a het-

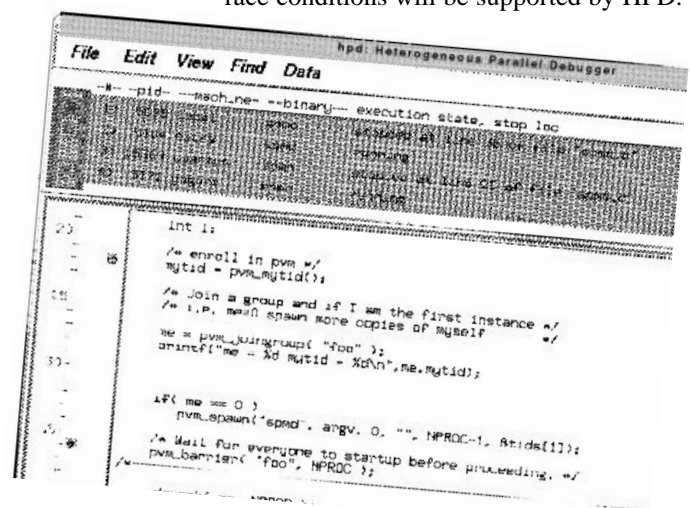
erogeneous set of workstations while providing the same capabilities and interfaces as on a homogeneous set of workstations. HPD is designed provide this capability.

Support for HPF: Support for debugging programs written in High Performance Fortran (HPF) is a capability users lack in any of the existing debuggers. This is a capability users will have in HPD. The ptools team is working with Portland Group, Inc. to provide source level HPF debugging support for HPD.

Visualization of data distributed across heterogeneous machines: Though visualization of data can be done through very sophisticated interfaces to visualization programs such as AVS, support for visualization of arrays and matrices is not provided by any debugger for workstations. The Prism debugger on CM5 is a good example of the usefulness of support for data visualization. HPD will provide support for visualization of data in data-parallel programs as well as in explicitly message passing programs. In the future, the ptools team intends to integrate HPD with other visualization projects such as DAQV (University of Oregon) as part of its continued participation in the Parallel Tools Consortium.

Ability to observe and manipulate messages that are queued up for processes: In debugging explicit message passing programs such as PVM, the ability to observe and manipulate messages is very helpful. HPD is designed to provide this capability.

A debugging strategy that will work even in the presence of nondeterministic behavior: Much of the difficulty of debugging parallel programs stems from their, often nonrepeatable, nondeterministic behavior. A debugging strategy, similar to Xmdb (March 1995 issue of BITS), that allows detection of race conditions will be supported by HPD.



HPD Capabilities

Some of the parallel debugging capabilities of the current HPD prototype are briefly described below.

Seamless integration with PVM: The current HPD version allows debugging of parallel programs written in PVM 3.3. There is no need to change the user code, link with a different library, or use a different run-time system to debug the PVM programs.

Barrier break point: The ability to break multiple processes at the same source line is an important capability. This capability is provided by HPD. However, note that these processes must share the same source code (SPMD paradigm).

Process set: In HPD, a process can be included in a process set by clicking on an icon that corresponds to a process. The user commands will be given only to those processes that are in the process set. These commands include continue, break, step over, and step into.

How to get HPD

For information on how to obtain and install HPD, please contact one of the authors or any member of the ptools team (ptools_team@lanl.gov).

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Tymnet Service to be Canceled

For many years, the Laboratory has had a subscription with Tymnet/BT North America, Inc. to provide Laboratory employees with remote access to the Laboratory's Integrated Computing Network (ICN). Tymnet also provides access to services such as Dialog, LEXUS/NEXUS, etc. The Tymnet subscription costs the Communications Group (CIC-4) \$75,000.00 a year. The problem is CIC-4 recovers less than 15% of the \$75,000.00 and can no longer afford to subsidize this service.

Based on conversations with Library Services, CIC-4 personnel, and the results of our e-mail survey to 125 Tymnet users, we have determined that the Laboratory Tymnet service is no longer needed and therefore will be canceled and no longer available after October 31, 1995.

For those of you who still use Tymnet, please use the options described in the remainder of this article.

Gaining Remote Access to the Laboratory

For those of you who access the Laboratory via Tymnet from home, while on travel, or away from the Lab, CIC-4 now offers an 800 number that provides Asynchronous, SLIP (Serial Line IP), and PPP (Point-to-Point Protocol) access to the ICN. The modems used to provide this service offer connection speeds up to 28.8 kbit/s. With compression enabled, the user terminal can run at speeds up to 115.2 kbit/s. The 800 number is (800) 443-1461. When you log on you will be asked for a cost center and program code. Your charge code will be charged 17 cents per minute of connect time.

The 800 number will not accept calls from foreign countries. If your travel takes you out of the country, the best way to access

the ICN would be to use a Lab calling card and dial one of the following numbers: (505) 667-9020, 9021, 9022, or 9023. These numbers provide the same service as the 800 number. A Lab calling card can be obtained by contacting the CIC Customer Service Center (cichelp@lanl.gov or 665-4444).

The 800 number described above also provides access to the Internet and the services listed below.

Accessing Services Outside the Lab

The following services that can be reached via Tymnet can now be reached via the Internet using the Internet addresses listed below. Individual accounts on these services can be obtained from Library Services at (505) 667-5809.

| | |
|---------------|---------------------|
| • Compuserve | compuserve.com |
| • Dialog | dialog.com |
| • LEXUS/NEXUS | lex.meaddata.com |
| • MELVYL | melvyl.ucop.edu |
| • WA ALERT | cqalert.com |
| • RLIN | rlg.stanford.edu |
| • OCLC | epic.prod.oclc.org |
| • STN | stnc.cas.org |
| • WESTLAW | westlaw.westlaw.com |

If none of these options work for you, or you need assistance using or accessing the Internet, please contact Steve Howard.

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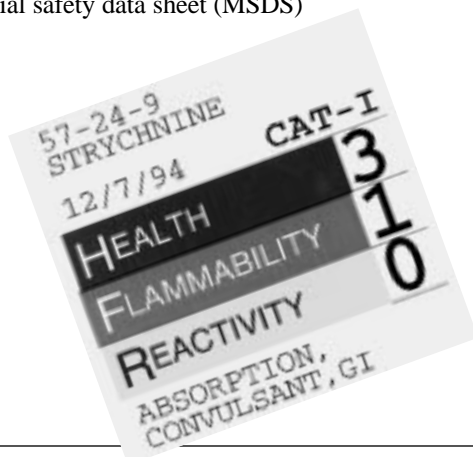
CHEMLABL Program Provides Labwide Consistency in Labeling Chemicals

Researchers at Los Alamos National Laboratory use some 22,000 chemicals and store them in nearly 200,000 containers. The containers of hazardous chemicals must be labeled accurately and consistently, no matter who is using them or where they are being stored. Labeling can be a real challenge because a single hazardous chemical may have several names (e.g., methylene chloride, dichloromethane, and methane dichloride), and the more multisyllabic of them have common nicknames. But researchers now have an accurate label-making program linked to databases of chemicals and their hazard designations to provide Labwide consistency in labeling hazardous chemicals.

The program, CHEMLABL, was refined for the Industrial Hygiene and Safety Group (ESH-5) by programmer Alan Werner (Applications Programming Group, CIC-12). ESH-5 had a prototype, for which Werner redesigned the interface and structure and added a user-defined database and other functions. CHEMLABL allows a user to search a database, select the chemical for which the label is needed, select the label size, adjust the positioning on the page, and print the information on preformatted, adhesive labels (see Figure 1). Both the old and new programs were written in Microsoft Visual Basic for PCs. The CHEMLABL program links the user to the main chemicals database, a supplemental database, and a user-defined database that each user can create for his or her frequently used chemicals. The supplemental database creates labels for custom solutions, including dilutions of chemicals, new chemicals, and those that are not hazardous but nonetheless need to be labeled.

Users can search the databases by the chemical name, the CAS (Chemical Abstract Service) number, the OHS (Occupational Health Service) number, or by hazardous effects. They can also search by health, fire, or reactivity ratings or any combination of attributes. A chemical's unique CAS number is one of 15 million numbers that distinguish individual chemicals. In Figure 1 it is the "57-24-9" at the top. The OHS numbers appear on the material safety data sheet (MSDS)

Figure 1: The CHEMLABL program allows users to search databases for a particular chemical and automatically print out a label for that chemical. The CHEMLABL databases, the labeling program, and the blank labels are available from ESH-5.



for the chemical. If the user knows the OHS number (OHS22080 for strychnine), he/she can use it as the search parameter. The program thus links the label to the MSDS for the particular chemical. The numbers 3, 1, and 0 in Figure 1 are hazard ratings on a 0-to-4 scale, in which 0 is a minimal hazard and 4 is a severe hazard. The health hazard rating and the descriptors ("absorption," "convulsant," "GI," etc.) are determined by an ESH-5 toxicology review and are based on OSHA guidelines and other criteria and refined for the way the chemical is used at the Laboratory. The flammability and reactivity hazard ratings are taken from National Fire Protection Association guidelines.

Feedback on the program has been very positive. Users appreciate the fact they can use any laser printer that works off of Windows software. User Darrell Hays (NMT-5) says the menu-driven CHEMLABL program is very intuitive, very easy to use, and gives unambiguous information. He needed to label a new chemical, a more environmentally friendly replacement for a chlorinated hydrocarbon. The MSDS did not give the information necessary to complete the label, so he contacted Jeff Schinkel of ESH-5. Schinkel did some research, entered the chemical Hays was using into the supplemental database, and provided blank labels along with the CHEMLABL program on a diskette. Hays says the program saves the time it would take to search through references or to chase down the right people with the right information. He adds that the label-making program is a boon for people who would otherwise have to try to write on small labels while working in a glove box and wearing the heavy glove box gloves.

The smallest label the program is designed to complete is the size of two side-by-side postage stamps and can fit on a 25-ml container. The intermediate size is 65 mm x 33 mm, and the large size is 120 mm x 92 mm. They are designed to work with most chemical containers in use at the Laboratory.

Schinkel's group updates the databases and issues new diskettes quarterly. Presently he is distributing the PC version of the program on request. Werner has developed a Mac version of the program, which is now being beta-tested. In making the Mac version identical to the PC version, Werner used Microsoft FoxPro as the database engine and SuperCard for the interface. Anyone interested in beta-testing the program should contact Schinkel (jeff_schinkel@lanl.gov or 667-7801) or Werner (akw@lanl.gov or 665-2153). The user should have the 7.5 operating system or AppleScript on an earlier operating system. Feedback is invited on both the PC and the Mac versions.

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New Rate Structure for CFS

For the past several years, charges for all storage on CFS (Common File System) have been the same whether the files were on disk, robotically-mounted tape, or manually-mounted tape. This policy is being changed this fiscal year to greatly reduce charges for files that have been inactive for some period of time. The rates for storage of active files and for file-access are slightly reduced as well. The costs per file will remain the same for all files.

The nominal difference between active and archive files is a six month (180 days to be exact) period without access. Because CFS has a definite limit on the amount of on-line storage reserved for active files, it is possible that the 180 day interval may have to be shortened. That is, files may be moved to the lower cost storage pool sooner. We will guarantee that, except for very small files, the 180 day interval will

not be lengthened to cause an increased cost to customers. The very small files (less than about 55K) will remain on disk and active indefinitely. The storage cost for these small files is so small that this should not be a problem anyway.

The rates for CFS storage services have always been given in terms of cost per megaword (a megaword is one million 60-bit words). This fiscal year the actual rates are based on the same units, but for better comparison with other storage services, we are also listing the rates in cost per gigabyte (a gigabyte is 2 to the power of 30 bytes).

The rate structures for CFS in Fiscal Years 1996 and 1995 are shown in the table below.

Tyce McLarty, Data Storage Systems Group (CIC-11)

| SERVICE | FY95 Rate | FY96 Rate |
|--|------------------------|-------------------------|
| Storage for Active Files | \$ 0.11/megaword/month | \$ 0.095/megaword/month |
| Storage For Archival Files | \$ 0.11/megaword/month | \$ 0.054/megaword/month |
| File Storage | \$ 0.03/file/month | \$ 0.03/file/month |
| File Access | \$ 0.15/access | \$0.10/access |
| The gigabyte equivalents for storage rates are as follows: | | |
| \$ 0.095/megaword/month = \$13.60/gigabyte/month | | |

Integration of Access and Resumix Saves Time and Money

The development of computer programs that integrate databases efficiently with text-based applications is filling a tremendous need in personnel administration as well as in scientific computing and other areas. The advent of Microsoft Access with embedded Microsoft Basic language for use in a windows environment has enabled the Laboratory's Human Resources (HR) Division to prepare and advertise job openings more efficiently.

Before March fifteenth of this year, preparing such job ads for the Lab's on-line job-vacancy system and various hard-copy reports involved typing and retyping the same information and comparing it with several databases as well as proofreading everything at each step. Now these tasks are done automatically, thanks to programs created by Mike Belcher (Applications Programming Group, CIC-12) using Access Basic, a subset of Microsoft's Visual Basic programming language. Belcher has taken the old job-tracking system (JTS) that was originally programmed in R:BASE and, using Access, has improved it so that the categorical-type information (job code, salary, division, job category, and so on) entered by personnel assistants is automatically compared with the Employee Information System and other databases, and, in a verification step, discrepancies are automatically pointed out.

Rosemary Baca, whose job is to prepare the job ads, says that formerly every job ad requisition was funneled through her workstation for eventual on-line or printed publication. Since it was not humanly possible to know every aspect of every requisition submitted, Baca spent much of her time in the process individually verifying system discrepancies with the personnel assistants who are directly accountable to those who initiate the job ad requisitions. Now the system alerts the personnel assistants to discrepancies before Baca works on the job ad. Baca can then automatically reverify the corrected information. Baca's job is also made easier because she can prepare the text-type information in a Word application and take advantage of its spell-checker and editing features. This entire process is driven by the JTS application code. After Baca exits Word, the corrected text is automatically transferred into the job ad format and into the JTS database. In fact, if the text is submitted in an electronic form such as e-mail, Baca doesn't have to key the information in at all; she can simply paste it into Word, proofread it, and edit it if necessary. Unlike the old system, the new one accepts an unlimited amount of text, so Baca doesn't have to call the owner of the job opening and ask for a shorter version, something that used to happen with some frequency.

Belcher's program, drawing from a number of employment information databases, allows Baca to customize job ad publication reports for the Newsbulletin, the monthly vacancy listings for HR-Staffing receptionists, and any other ad hoc database queries or reports. Jobs can be sorted by division, job category, or any other designator contained in the many tables that make up the database. In addition the new JTS updates the Resumix database, if necessary, while daily creating current job ad files for the on-line vacancy system, which includes all the formatting criteria for on-line sorting. With a variety of macros and button modules, the system is also programmed to create a file update of all external Lab job ads for posting on an outside-vendor-operated electronic bulletin board, which lists job openings for all Department of Energy facilities throughout the U.S.

The system also enables runtime executable versions of JTS, which can be operated from other workstations that do not require installation of the full Access software application, a money-saving feature for HR. This enables Baca to train a backup to run the program for data entry only and to produce the regularly required reports. Currently only one other employee, Theresa Sandoval, HR-Staffing Personnel Assistant in the reception area, has been trained to operate JTS.

Resumix is now easily updatable through JTS utilizing FTP (file transfer protocol) transfers and the Resumix Importer/-Exporter tool to effect the transfer process. Any changes Baca (or others who have access to the database) makes are automatically uploaded to the Resumix system. Thus, the change in a job status is made automatically instead of being dependent on someone remembering to make a phone call.

It's this sort of automation, made possible by new software and programming languages, that provides a much more efficient, less labor-intensive reporting system for the Laboratory.

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CIC-6 Discontinues Hard Copy

For many years CIC Division has operated a documentation center for its users to obtain vendor and local computer documentation in hard copy form. Due to budget shortfalls, the Customer Service Group (CIC-6) regretfully announces that it must now discontinue this service as of October 1, 1995. This does not mean you can no longer obtain documentation. Vendor documentation can be purchased directly from the vendor (see table below). Please let us know if you need assistance contacting the appropriate vendor. Much of the local documentation we offered in hard copy is now available on-line through Explorer. Explorer is a Web application developed by the Information Storage and Retrieval Group (CIC-15) that provides textual and graphical information with robust search and retrieval capabilities. This on-line availability will enable you to access computer documentation in a quick and efficient manner. You can access Explorer from the

LANL home page by clicking on "Info by Subject/Explorer" or by entering the following URL:

<http://iosun.lanl.gov2001/explorer.html>

Several useful documents like the "Network Services User Guide" and "UNICOS at Los Alamos User Guide" can be accessed through Explorer's Systems Documentation page which is located at

<http://iosun.lanl.gov:2001/htmls/infoSys/infoSys.html>

In the table below is the information you will need to contact vendors. You will need to place your own purchase requests with each vendor.

*Lourdes Martinez, lzm@lanl.gov, (505) 667-6992
Customer Service Group (CIC-6)*

| Vendor | Phone | Contact |
|--|-----------------------|--|
| Computer Associates (IDMS) only on CD ROM. | (800) 841-8743 | Operator will come on, and the order can be placed at that time. |
| Cray Research Inc. CD ROM cost: \$50.00 each. | (612) 683-5907 | Jan Lauby, Mona Diensen, and Bonnie Hanks. |
| Digital Only hard copy documentation. | (800) 852-5858 | You will get a recording. To place an order, press option 1, and then press option 1 again. |
| IBM Corporation CD ROM is available, but you will need to give the version and title so that the operator can check to see if the document is on CD ROM. | (800) 879-2755 | When placing an order, the operator will come on. Give the operator the the account #9212004, this number will give the mailing address. You will need to provide the operator with a group and mail stop. |
| Thinking Machines Corp. Working to put ordering on-line; will be on Webserver and Netscape. | (617) 234-2706 | Gabrielle Siset. |
| Sun Microsystems Only hard copy documentation. | (800) 873-7869 | Operator will come on, and the order can be placed at that time. |

Proposal Mining and Marketing on the World Wide Web

Looking for new funding sources? Have a research project in need of a sponsor? Don't have a lot of time to spend searching for possibilities? The World Wide Web (WWW) holds a wealth of proposal information if you know where, and how, to look. As with any program development effort, once you've determined your strengths and goals, you begin searching for sponsor matches. Some potential sponsors are obvious. You've worked with them in the past; they know your capabilities; you know their needs and interests. Often, however, many potential sponsors are overlooked for lack of information about where their needs and your capabilities overlap.

In the old paper-based information exchange system, tracking down new leads and program solicitations was a challenging and costly task. As more and more organizations join the WWW, however, the situation has begun to change. Home pages for all the major government agencies are now available on the WWW. A number of these agencies, including the Department of Defense (DoD) and the National Aeronautics and Space Administration (NASA), have turned to on-line solicitations, requests for proposals (RFPs), requests for information (RFIs), and program announcements. The result— instant information.

Making the Most of Government Web Sites

Using Netscape or Mosaic, you can discover the latest research opportunities with DOE, DoD, and other federal agencies by checking their web sites (choose the File menu and select Open Location for Netscape or Open URL for Mosaic, then type the address). Some of the more useful sites we've mapped are shown in the accompanying table.

This list of sites is by no means comprehensive, but it gives you some idea of the kinds of valuable proposal information now available over the WWW. Use these sites to find new funding sources, check up on your competition, or keep informed of the latest developments in the federal research world.

Hunting for Key Words

When using WWW sites to mine information for proposal leads, look for hot links (highlighted texts) and buttons that include words such as grants, proposals, contracts, procurements, and programs. If these words are not found directly on

your potential sponsor's home page, try clicking on hot links such as About (Your Sponsor's Name), Hot Topics, News and Information, Opportunities, or Financial Information. The information you seek is almost always available, sometimes it's just a matter of finding it. When you do discover a hidden source, make sure to add it to your bookmarks (choose the Bookmarks menu in Netscape and select "Add" or choose the Hotlist menu in Mosaic and select "Add this Document").

Add value to your proposal efforts by mapping your own sites using Netscape or Mosaic to make bookmarks for your most visited or useful pages. When mining for information, take a few minutes to explore new sites. Jumpstations and lists of interesting sites (found on most home pages) are useful for exploring the Web. This is a good way of finding new proposal leads. Considering that the WWW now hosts 7.7 million sites, the possibility of turning up new business is very good.

Marketing through Hot Links

When surfing sponsor home pages, if you notice that LANL is not mentioned in areas of applicable research and is not connected via a hot link to that page, contact the web-mistress/master for that site (after first seeking permission from your supervisor and ensuring that the information on your page or links associated with that page are not proprietary, sensitive, or classified). Hot links are becoming an important marketing tool, and systems administrators are generally happy to add them. Contacting potential sponsors for a nonproposal event is a good way of introducing yourself. Adding a hot link will give LANL good long-term exposure so that when the ideal solicitation comes up, you're no stranger to the sponsor.

Once you've found a sponsor for your proposal, if you're having trouble understanding their requirements, guidelines, or format—or would like writing, editing, or graphics support—call the CIC-1 proposal specialists at 667-INFO (4636). We can help turn your winning technical solution into a winning proposal.

*Dawn Hipsh, dhipsh@lanl.gov, (505) 665-3656
Communication Arts and Services Group (CIC-1)*

| Agency | Address |
|--|--|
| <ul style="list-style-type: none"> • Advanced Research Projects Agency • Centers for Disease Control and Prevention • Department of Defense <ul style="list-style-type: none"> — Defense Information Systems Agency • Department of Energy <ul style="list-style-type: none"> — Office of Energy Efficiency and Renewable Energy — Office of Energy Research • Department of Health and Human Services • Department of the Interior <ul style="list-style-type: none"> — United States Geological Survey • Department of Transportation • Environmental Protection Agency • Federal Aviation Administration • National Aeronautics and Space Administration (NASA) <ul style="list-style-type: none"> — High Performance Computing • NASA Space Station Office Procurement • National Coordination Office for High Performance Computing and Communications • National Institutes of Health • National Science Foundation • National Telecommunications and Information Administration | <ul style="list-style-type: none"> http://www.arpa.mil/baa/ http://www.cdc.gov/funding.htm http://www.dod.mil/ http://www.disa.mil/info/disabull.html http://www.disall.disa.atd.net/disacfe/cbdannmt.html http://www.doe.gov http://www.eren.doc.gov/ee_news-FG00.html http://www.acl.lanl.gov/DOE/OER.html http://www.os.dhhs.gov/ http://www.usgs.gov/contracts/index.html http://www.dot.gov/dotinfo/general/procure.html gopher://gopher.epa.gov:70/11/info gopher://gopher.faa.gov/ http://www.hq.nasa.gov/office/procurement http://cesdis.gsfc.nasa.gov/hpccm/hpcc.nasa.html http://www.jsc.nasa.gov/og3/ http://www.hpcc.gov/grants-contracts/index.html http://www.nih.gov/ http://www.nsf.gov http://www.ntia.doc.gov/ |
| Other Helpful Sites | |
| <ul style="list-style-type: none"> • Information Technology Hotlist • FedWorld Information Network • Federal Acquisition Jumpstation • FedWeb Locator • Miscellaneous proposal information | <ul style="list-style-type: none"> http://www.fedsources.com/hotlist.html http://www.fedworld.gov http://procure.msfc.nasa.gov/fedproc/home.html http://www.law.vill.edu/Fed-Agency/fedweb.indep.html#epa http://www2.ari.net/home/cdickson/wwwprop.html |

Why Not <BLINK> and <CENTER>? —Writing HTML for Portability



Most Web authors have had it happen. (I have, and I'm not alone.) We sit alone at our computer, carefully adjusting the mix of fonts, images, and backgrounds, until we have constructed what appears to be a well-balanced, effective Web page. Sure of ourselves, we publish the page. . . and hear from our users:

- the print is unreadable
- the background is ugly
- the images take too long to load

Still certain that the problem can't be the page, we walk over to a user's machine and discover . . . they're right. The page is a dog.

There are many reasons why pages look and act differently from machine to machine—so many, in fact, that any attempt at a client-side “solution” won't work. Even if we were to say, for example, “Everyone needs to use Netscape,” we'd still encounter differences due to

- screen resolutions,
- display drivers,
- color settings,
- processor speeds,
- network connections, and
- browser configuration.

(Other problems with mandating a single browser include the facts that (a) we can't control what people use outside the Laboratory, (b) not everyone agrees which browser is best, and (c) emerging products, such as Microsoft's Internet Explorer, will continue to ensure that what is “best” will remain a rapidly moving target.)

No matter how we strive to control the appearance of our pages, variations such as the above will continue to ensure that our success will remain limited, at best. It's the nature of the Web, and the only good starting point is to accept it.

A Root Cause: SGML

The fundamental cause of the difficulty in controlling page appearance is that the basic goal of Web protocols is portability, not appearance. The HyperText Transfer Protocol (HTTP) and HyperText Markup Language (HTML) were originally conceived as ways that a single document could be shared among many different machines running a variety of operating systems and software. To achieve this, HTML primarily describes the content of a document and leaves the interpreta-

tion and rendering of that content to the client software that receives it. It is this aspect—the separation of content from interpretation—that most clearly reveals HTML's kinship with the Standard Generalized Markup Language (SGML).

SGML is an international standard (ISO 8879) that grew out of the Generalized Markup Language (GML) created at IBM in 1969. “Markup” consists of instructions added to a document that identify each part of the document (a title, a paragraph, a list item, etc.). SGML describes how markup languages should be constructed (e.g., how do you define a tag?). HTML, in turn, is a simple, popular application of the SGML standard.

Three concepts from SGML are particularly important for the current discussion: elements, tags, and attributes. An “element” is simply a part of a document. It can be a single word, a group of words, or (in the case of HTML) an image or other embedded item.

A “tag” is a piece of markup used to identify an element. For instance, within HTML, the <H1> tag identifies a first-level heading element, <H2> identifies a second-level heading element, and so on. As marked by their tags, elements can sometimes be embedded within each other (such as hypertext links within a paragraph).

An attribute is a descriptive characteristic included with the tag that provides additional information about an element (such as its alignment, the action to perform on it, etc.).

Within HTML 2.x, the <H1 ALIGN=CENTER> tag identifies a first-level heading (an H1 element) with centered alignment (the ALIGN=CENTER attribute).

It follows from this that, in pure terms,

- the basic tag should always identify what an element is, not how it should be rendered;
- an attribute should only be used in conjunction with the tag whose element the attribute describes; and
- all control over rendering should be given to the reader, not the author.

Needless to say, in practice, the Web is hardly “pure.”

Inevitability Breeds Acceptance

From the outset, HTML has contained certain violations of the above three points. For instance, suppose an author wants to call attention to a particular word. In a purely content-driven SGML application, this would be done with a tag like `<IMPORTANT-WORD>`, which would identify content, not rendition. HTML, however, offers tags such as `` for bold, `<I>` for italics, `<BIG>` for big letters, and so on—all of which specify rendition, not content. (Note, however, that HTML also offers the somewhat more “correct” `` for emphasis and `` for strong emphasis, both of which leave the rendition to the reader.)

“Violations” such as the above are so widespread in their use (and so easy) that they have become accepted. This has contributed to the perception that markup is meant to control appearance, not define content, which has in turn led to

- standard tags being used for purposes for which they were not designed, and
- a profusion of new tags being proposed (e.g., `<BLINK>`).

Even as we accept some of these “violations,” problems remain. For instance, even though we might think that `<I>` should mean italics, final control over how `<I>` is displayed still resides within the reader’s software. Hence, for character-interface browsers such as Lynx, italics are typically either translated into bold or ignored.

Furthermore, portability can suffer as we deviate from “pure” SGML. It’s hard to find much harm in `` for bold, but using, for example, an `<H2>` heading tag to control font size for a paragraph (instead of to identify a second-level heading) can have unexpected consequences (see “Practical Tips,” on pages 12 and 13).

Finally, no matter how much we try to control appearance through these “violations,” there will still be variations due to screen resolutions, display drivers, and the other factors listed above.

In short, there are valid reasons to guard against the misuse of existing tags, an overacceptance of new tags, and the acceptance of new tags that do not conform to the fundamental spirit of SGML.

It’s Not “Just Netscape” Anymore

In the past this type of discussion has fallen too often into a “Netscape vs. everyone else” type of framework. In one camp

were those who used and advocated Netscape-specific extensions (such as `<CENTER>` and `<BLINK>`), while the other camp held to standards developed by the Internet Engineering Task Force (IETF). The Netscape camp argued that the Netscape browser was a de facto standard and the extensions were useful, so why not take advantage of them? The other camp argued that the Internet was too diverse to allow any single vendor to set “standards” at will.

Now that Microsoft has released the beta version of its Internet Explorer for Windows 95, there’s a whole new set of vendor-specific tags to deal with. Under Microsoft’s version of HTML, you can

- give a different color to each cell in a table,
- add background sounds to a page, and
- build scrolling text marquees.

While these may sound like neat features to some people, others of us get a sense of “deja vu all over again.” Once again, we have an important vendor offering its own version of HTML, which will predictably make the “what is HTML?” discussion even more lively.

This is good because it puts evolutionary pressure onto the HTML standard, but it also reinforces our rationale for preferring industry-wide standards over product-specific extensions.

Other Tools/Formats Are Available

HTML was designed to be simple, flexible, and highly portable, which is both its strength and the source of its weakness in terms of controlling appearance. It is not the only on-line format available, however, and it is not always the best.

For cases where control over appearance is especially important (maps, etc.), consider Adobe Acrobat’s portable document format (PDF). It is not as portable as HTML, but if control over appearance is what you need, PDF is more compact, more consistent, and more widely supported than Postscript.

For other cases (3-D models, etc.), other formats are available. Again, portability is sacrificed, but portability is not always the primary concern.

HTML is very good for doing what it is designed to do, but it should also be used within its limitations.

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Communications Arts and Services (CIC-1)*

Practical Tips

In collaboration with various groups around the Laboratory, the Information Architecture (IA) project has defined a “standard” for using HTML at the Laboratory based on

- support from multiple browsers, and
- alignment with published materials from the IETF HTML Working Group.

The multiple browser requirement ensures practicality; we only use features that are in fact supported. The alignment with the IETF ensures openness; all of the major browser manufacturers have promised to support the IETF standard as it emerges.

These criteria enable the IA “standard” (or technical guideline) to continually evolve. (On the day I’m writing this, Netscape just issued a new beta release, which, among other things, supports the ALIGN=RIGHT attribute for paragraphs and headers. Since this attribute is called for by the IETF and supported by NCSA Mosaic, it has now been added to our list of “acceptable” HTML.)

To see the IA technical guideline on HTML, refer to “TE-5815: Laboratory Standard HTML,” which can be found on the Web under Official Documents, Information Architecture Guidelines and Standards:

<http://www.lanl.gov/projects/ia/stds/>

Additional tips about implementing HTML are presented below.

Watch Out for Formatting with <H?> Tags

The heading tags (<H1>, <H2>, etc.) are intended to identify headings, not to control font size. Problems associated with misusing these tags include the following:

- Unless someone has the same screen resolution and browser configuration as you, the font won’t look the same and the attempt to control font size will be defeated. People who are visually impaired, for example, have a valid reason to increase their default font sizes, which can lead to very different results than the author intends.
- Browsers are emerging that read the <H?> tags to determine the structure of a document and to automatically build, for example, tables of contents. Everything marked with an <H?> tag will be included, which can be unfortunate, at least.

The general guidance is to use tags for their intended purpose. To markup a heading, use <H?>; to markup a paragraph, use <P>. If you really want a bigger font, support for the <BIG> tag appears on the way, which offers a better (though not yet “standard”) approach.

Alignment is an Attribute, Not an Element

In a philosophical sense, alignment is something you do to the content, not a description of the content. Hence, it is preferable to associate centering or right alignment with whatever is to be acted upon. For example, <P ALIGN=CENTER> is better than a simple <CENTER>. (Alignment is also available for <H1-6>.)

In practical terms, Netscape may have introduced the <CENTER> tag, but it still supports the ALIGN=CENTER attribute, so nothing is lost by adhering to IETF guidance.

Tables are Acceptable, if . . .

Contrary to what many seem to believe, tables are not unique to Netscape; they are part of an IETF HTML draft and are widely supported by modern browsers (including NCSA Mosaic 2.x and Microsoft Internet Explorer). The IA recommends, however, that text-only alternatives be provided for older browsers and that product-unique features be avoided (such as variable background colors that can only be read by Microsoft Internet Explorer).

Be Careful with Backgrounds

Backgrounds, again, are acceptable under the IA guidance. The “standard” way to implement these is through a GIF or JPEG image, however, not a color specification. Subtle textures and colors are preferable to keep the text readable. Remember that not all browsers can interpret the background, so don’t use it to communicate important information that the reader needs to see. And finally, especially with backgrounds, test before you post (see below).

Test on Multiple Browsers, Multiple Machines

Since there is no way to predict what tools your readers will be using (especially if you are publishing to the outside world on the open Internet), the best way to evaluate the quality of a Web page is to test it with various browsers on various machines at various screen resolutions. As mentioned at the start of this article, what works fine under one setup can be very bad under another.

Don’t <BLINK>, unless . . .

<BLINK> is a Netscape-specific tag, not endorsed by the IETF (or the IA). In practical terms, the main problem is that it is the subject of debate, and a significant portion of the Web community views it as amateurish, unprofessional, irritating, “deliberately tacky” (a quote), etc. Unless you want those words used to describe one of your pages, you’re better off avoiding <BLINK>.

Rely on Content

No matter what we do, different people will have different reactions to the way our Web pages look. For some people, our images will be too big and take too long to load; for others, the images will be too few and the page boring. Expect contradictory critiques, try to address the various concerns, but accept the fact that you can't always please everyone.

Remember, though, almost no one will visit your Web page just to see how it looks. They'll almost always be looking for information, and the best way to ensure the success of your Web page is to make that information accessible and valuable.

Revised "Computing at LANL" Web Menus

During November 1995, information on the Web relevant to the computing resources at LANL will be restructured to facilitate ease of use. The "Computing at LANL" entry will be listed as a separate entity on the LANL home page rather than being included under "Services."

Our objective is to present information in a logically "weighted" order. Those major topics that have significant interest will appear in a priority order. Most information will be available within three subordinate screen searches. To achieve this we reduced the current "Computing at LANL" headings through consolidation and subordination. The new "Computing at LANL" Web page will have the following entries:

- Welcome to the Integrated Computing Network (ICN)
(New users should reference this first)
- CIC News—Bits
- CIC Groups/Centers/Affiliates (description of)
- Documentation
- Electronic Mail
- Forms (electronic to hard copy)

- ICN Validation and Registration
- ICN Change Bulletins
- Network Services and Resources (description of)
- Miscellaneous Entries
- Project Descriptions/Reports
- Security
- Services and Resources (description of)
- Software Distribution via On-line
- Training Schedules

An attempt has been made to "qualify" all titles so they stand on their own. All titles will be alphabetized with the exception of the leading title (which is intended to grab the new user and help them avoid a lengthy search).

Your suggestions on how we can improve the presentation of information, as well as the information itself, are welcome. Please e-mail suggestions to computing_www@lanl.gov.

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Customer Service Group (CIC-6)*

Web Access to SCISearch Database Now Available

The Research Library (CIC-14) has a new database, SCISearch(R), available from its home page (<http://lib-www.lanl.gov>). Located under "Electronic Databases," SCISearch(R) is based upon Science Citation Index(R), an international multidisciplinary index to science and technology literature produced by the Institute for Scientific Information(R). Updated weekly with roughly 15,000 new citations, SCISearch(R) currently spans 1985 to the present and includes 3,300 worldwide journals from 100 scientific disciplines as well as an additional 700 journals from the Current Contents(R) series of publications. All significant items in these journals are included such as articles, editorials, letters, etc., which can be searched by fields such as author, title, abstract words, journal source, institution, categories, document type, and language. The SCISearch(R) database contains over 7.5 million citations, 100 million cited references, and 41 million hyperlinks within the database.

One of the strengths of SCISearch(R) lies in its ability to do cited reference searching. A known paper can be searched to identify more recent papers that cite the known paper. The impact of a particular paper can be assessed by tracking its cited references. The database also contains hyperlinked bibliographies from the cited paper, which allows a concept to be tracked backwards in time.

Developed by the Library Without Walls project in collaboration with the Advanced Database and Information Technology Group (CIC-15), SCISearch uses the Explorer software technology and is based on Verity's Topic. Access to SCISearch(R) is restricted to employees of Los Alamos National Laboratory and to individuals associated with the member institutions of the Library Services Alliance of New Mexico.

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Research Library (CIC-14)*

Accessing Register.lanl.gov from Open and Administrative Lines

Whether you need to change your ICN password, initialize or resynchronize your smartcard, or register for CIC services, you will probably need to access the CIC REGISTER machine at least once in the next six months. If you are unsure as to how to access the CIC-Division register machine, here are 3 examples to help you along.

Situation: You are on an Open or Administrative network and have a telnet application.

Solution: Telnet to register.lanl.gov

Example 1

```
telnet register.lanl.gov
```

```
Trying 128.165.3.1...
```

```
Connected to info-server.lanl.gov.
```

```
Escape character is '^]'.
```

```
Welcome to the ICN User Registration Service
```

```
Please enter your 6-digit ICN User Number: 012345
```

```
(Note: Enter your own user number.)
```

```
Notice: We have added a new menu to allow you to change your ICN password, set up  
your smartcard, and go to the familiar e-mail and CIC service registration.
```

```
Registration for 012345
```

- ```
1. Go to E-mail and CIC service registration
2. Change your ICN password
3. Set your smartcard's PIN
4. Resynchronize your smartcard
```

```
Enter option [exit]:
```

```
.
.
.
```

**Situation:** You access the CCF through a micom port.

**Solution:** Access register.lanl.gov through the TIG (Terminal Internet Gateway).

### Example 2

```
CONNECTED TO CHANNEL 87-01/011
```

```
Los Alamos Integrated Computing Network
```

```
PORT 87-06/022 ENTER OPTION: tig
```

```
CONNECTED TO CHANNEL 87-06/004
```

```
UNAUTHORIZED ACCESS IS PROHIBITED
```

```
Los Alamos National Laboratory (tig)
```

```
Login as "help" for assistance
```

User Access Verification

Username: **register**

Welcome to the ICN User Registration Service

Please enter your 6-digit ICN User Number: **012345**  
(Note: Enter your own user number.)

.  
.  
.

**Situation:** You don't know how to connect to other machines but you can get to IA or IO (Labwide IAvax and Inform Open iovax).

**Solution:** Sign onto IA or IO systems and choose AC (Access Control System), which will get you to the register machine.

### Example 3

F19-0-000A LOS ALAMOS NATIONAL LABORATORY  
INFORMATION SYSTEMS 10/13/95 SYSTEM SELECTION MENU

YOU HAVE THE FOLLOWING OPTIONS

|    |                               |     |                              |
|----|-------------------------------|-----|------------------------------|
| AF | Affiliates Information System | PF  | Performance Appraisal System |
| AC | Account Control System        | PS  | Personnel System             |
| AU | Laboratory Authors System     | RP2 | Receiving/Procurement (PAID) |
| BU | Budget System                 | SR  | Salary Review System         |
| CE | Capital Equipment System      | ST  | Stores                       |
| DR | Document Request System       | TR  | Travel                       |
| MC | Mail Channels                 | IB  | IBM Production Systems       |

HE HELP  
LO LOG OFF SYSTEM  
ENTER THE DESIRED OPTION: **AC**

Trying... Connected to INFO-SERVER.

Welcome to the ICN User Registration Service

Please enter your 6-digit ICN User Number: **012345**  
(Note: Enter your own user number.)

.  
.  
.

If you have further questions on accessing register.lanl.gov, please call the Customer Service Center at (505) 665-4444.

*Sara Harshman, consult@lanl.gov, (505) 667-5746  
Customer Service Group (CIC-6)*

# Balancing and Distributing Workload on the Clusters with Load Sharing Facility

## What is LSF?

Load Sharing Facility (LSF) from Platform Computing Corp. is a load sharing and distributed batch queuing software suite that integrates a network of UNIX systems to reduce interactive response time, increase batch throughput, and improve computing resource accessibility. LSF schedules jobs based on the availability and load of heterogeneous hardware and software resources as well as on the resource requirements of the jobs, ensuring that jobs run on the best available machines. Fully transparent remote processing of jobs is supported, including remote terminal I/O, signals, and file access. Job accounting data and analysis tools are also available. LSF supports parallel applications and packages such as PVM. LSF is highly fault tolerant and supports job checkpointing and migration. A Motif-based GUI suite is also available.

LSF is currently installed only on the Open Network Compute Server but will be installed on the Secure Network Compute Server as the need for load balancing increases.

## LSF and the LANL User

There are a number of preparations you need to take care of before using LSF on the LANL Open Network Compute Server. First you need to make sure that your PATH environment variable includes /usr/local/lsf/bin and, if you intend to use the checkpoint/migration capabilities, also include /usr/local/lsf/lib.

Probably the best way to become familiar with LSF is to get a user's guide. You can request a hard copy by sending an e-mail to cluster\_team@lanl.gov. User's guides can also be obtained from Platform Computing Corp., whose contact information is at the end of this article. If you are in the lanl.gov domain you may also download and print a user guide by anonymous "ftping" to ibmwww.lanl.gov in the directory /pub/Risc\_6000/lfsdocs or access the Cluster Web page dealing with LSF, which is located at <http://ibm-08.lanl.gov/ONCS/LSF.html>. A complete set of man pages is also available in /usr/local/man. A good starting place is "man lsintro".

Here is a simple example of how to get started using LSF. Suppose I have an executable job, script, or command. If I were not using LSF I would run it stand alone on a single node. But using LSF I would include "bsub" before it. The bsub command in it's simplest form has no arguments and submits the job to the LSF system. I will use the command sleep for my simple example:

```
% bsub sleep 60
```

If everything is set up right, LSF returns a job id like the following:

```
Job <791> is submitted to default queue <priority>
```

If I want to check on the status of my job I can type "bjobs" and it returns the following:

```
% bjobs
JOBID USER STAT QUEUE FROM_HOST EXEC_HOST JOB_NAME SUBMIT_TIME
791 dlora RUN priority ibm-08 ibm-05 sleep 60 Oct 16 13:35
```

From this I can see that the job was submitted from ibm-08 and routed for execution to ibm-05, the least loaded machine at the time. Next I get a mail message on the node where the job ran that looks like the following (in my case it gets routed by the .forward file to dlora@lanl.gov):

```
From: lsbatch system <dlora@ibm-05.lanl.gov>
Date: Mon Oct 16, 1:36pm
To: dlora@ibm-05.lanl.gov
Cc:
```

Subject: batch job 791: <sleep 60> Done  
Sender: LS Batch System <dlora@ibm-05.lanl.gov>  
Job <sleep 60> was submitted from host <ibm-08> by user <dlora>.  
Job was executed on host(s) <ibm-05>, in queue <priority>.  
</u>dlora was used as the home directory.  
</u>dlora was used as the working directory.  
Started at Mon Oct 16 13:35:07 1995  
Results reported at Mon Oct 16 13:36:08 1995  
Your job looked like:

---

# LSBATCH: User input

sleep 60

---

Successfully completed. CPU time used is: 0.2 sec.

The output (if any) follows:

---

By default, standard error and standard out are put in the mail message. They can be routed to a file by using the bsub command line arguments -e and -o, respectively. The bsub command is really a focal point for the user's interface with batch and parallel job submission in LSF.

If I had wanted to kill the job while it was waiting in queue for a host or while it was running but not completed, I would have used "bkill 971". There are many other commands for use with the batch part of LSF. The man page for lsbatch will give you an overview of the individual commands.

The real benefit of using LSF is better turn around time for those who use it. We often see many jobs competing on the same node while another node sits idle; that shouldn't happen if you use LSF.

LSF appears to be one of the most complete load balancing products on the market, so over time we intend to discontinue some of the other load balancing/queuing packages that are currently installed, such as DQS and NCLOGIN. We also intend to alias some of the commands that users are familiar with from those packages such as nload so that users will still get load information from LSF when issuing those commands. Since the overall utilization of the machines as well as individual job turnaround can be improved using LSF, we will be working on ways to give preferential treatment to jobs that come in through the LSF system.

### LSF and PVM Parallel Jobs

For the Open Network Compute Server at LANL, we have tailored the pvmjob script in /usr/local/lsf/bin to set up PVM jobs for the environment at LANL. The pvmjob script is a wrapper for running PVM jobs under lsbatch. You can submit a PVM job by typing "bsub [otheroptions] -n k pvmjob <pvmexecutable>", where k is the number of hosts to use. This script sets up appropriate environment variables as well as controlling the starting and clean up of the PVM daemons on the least loaded nodes in the cluster. You just have to specify the number of nodes you want to run on. For example, I copied the PVM examples from /usr/lanl/pvm3/examples to /home/dlora/pvmtest and after "making" the examples, I used the pvmjob script to test PVM under LSF.

Note that in the current version of the pvmjob script the \$PWD environment variable is used to create the execution path line in the hostfile, so with "\* ep=\$PWD" at the top of the hostfile it is assumed that the master and/or slave programs can be found in the present working directory.

Here is the dialog from one of those tests, a master slave program called hello:




---

```
/u/dlora/pvmtest $ bsub -n 2 pvmjob /u/dlora/pvmtest/hello
```

```
Job <792> is submitted to default queue <priority>.
```

```
/u/dlora/pvmtest $ bjobs
```

| JOBID | USER  | STAT | QUEUE    | FROM_HOST | EXEC_HOST        | JOB_NAME   | SUBMIT_TIME  |
|-------|-------|------|----------|-----------|------------------|------------|--------------|
| 792   | dlora | RUN  | priority | ibm-08    | ibm-05<br>ibm-06 | *est/hello | Oct 16 16:12 |

The output back to me would be as follows:

```
Sender: LS Batch System <dlora@ibm-05.lanl.gov>
```

```
Job <pvmjob /u/dlora/pvmtest/hello> was submitted from host <ibm-08> by user <dlora>.
```

```
Job was executed on host(s) <ibm-05>, in queue <priority>.
<ibm-06>
```

```
</u/dlora> was used as the home directory.
```

```
</u/dlora/pvmtest> was used as the working directory.
```

```
Started at Mon Oct 16 16:12:38 1995
```

```
Results reported at Mon Oct 16 16:12:53 1995
```

```
Your job looked like:
```

---

```
LSBATCH: User input
```

```
pvmjob /u/dlora/pvmtest/hello
```

---

```
Successfully completed. CPU time used is: 0.8 sec.
```

```
The output (if any) follows:
```

```
/tmp/JHBgpRwAAA
```

```
i'm t40001
```

WARNING: XPVM not accessible...no tracing will occur

from t40003: hello, world from ibm-05

pvm already running.

pvm>

---

I submitted job number 792 from ibm-08. LSF picked the least loaded nodes, ibm-05 and ibm-06, and started up the PVM daemons on them; then LSF executed the master slave program and stopped the PVM daemons.

To further illustrate using bsub options and PVM under LSF, here are some examples from Richard Barrett, rbarrett@lanl.gov, who you should contact for PVM help.

#### Example 1: Submitting a job

```
bsub -b 16:15 -t 16:40 -n 4 pvmjob xdiffuse2d

 1 2 3 4
```

1 = Time job should begin execution; default is "now."

2 = Time job should terminate execution if it is still running; default is whenever it finishes.

3 = Number of tasks requested.

4 = `_full_` path to user executable or executable name (note again that the `pvmjob` script assumes that you are submitting the job from within the directory where your pvm executables are located).

#### Example 2: Submitting a job that requires user interaction

```
setenv LSB_HOSTS "`lsplace -R - -n 4`"; pvmjob /u/rbarrett/GRID/BLACS/xgrid2
```

After excuting the above, submit the job as shown in example 1.

#### LSF and Checkpoint/Migration

LSF provides the capabilities to checkpoint and migrate jobs automatically or at the user's direction. If an LSF job is checkpointable and the LSF scheduler determines that the node where the program is running is too busy, then the job is checkpointed and migrated to the least loaded node in the cluster, where it is restarted and run. If a job is not checkpointable and the load gets too great, then it is suspended until the load drops and then later resumed on the same node.

In order to be checkpointable, your job must link to the checkpoint user library `/usr/local/lsf/lib/libckpt.a`.

This library consists of a set of file system call stubs for file operations intercepted by the checkpointing facility and for routines used internally to implement checkpointing. It also contains a checkpoint signal handler.

All applications must be linked with `libckpt.a` and a special checkpoint startup routine, `ckpt_crt0.o`, in order to be checkpointable. Because compilers will automatically link to `crt0.o`, you must link your program by calling a customized linker directly and then replace `crt0.o` with `ckpt_crt0.o`.

The LSF administrator on the cluster has installed two special linkers, `ckpt_ld` and `ckpt_ld_f`, that will automatically take care of the linking with `libckpt.a` and `ckpt crt0.o`; `ckpt_ld` is for linking C programs and `ckpt_ld_f` is for linking Fortran programs. You should be able to use `ckpt_ld` and `ckpt_ld_f` in the same way you would use an ordinary `ld`.

For example, to build a checkpointable job using the C program `myjob.c`, excute the following :

```
%cc -c myjob.c
%ckpt_ld -o myjob myjob.o
```

### Checkpoint Limitations

`SIGHUP` is used internally to implement checkpointing. Do not use the same signal in your program.

Because of the way UNIX is implemented, it is impossible to checkpoint a job if the job's context is too complicated to recreate. However, most compute intensive sequential jobs are suitable for checkpointing.

The following types of jobs are not suitable and are not guaranteed to work with the checkpoint facility:

- Parallel jobs (there is no way to checkpoint a parallel job, e.g., PVM or MPI).
- Jobs that fork a child.
- Jobs that use UNIX sockets, semaphores, or shared memory to communicate with other processes.
- Jobs that call `setuid()` or `setgid()`.
- Jobs that use internal timers.

When submitting your checkpointable job through LSF, you must remember to use

```
bsub -k <checkpoint directory> <checkpoint period in mins> <executable name>.
```

To checkpoint once an hour we would use

```
% bsub -k /scratch08/dlclams/chk 60 clamprep
```

To make your job checkpointable so that the LSF scheduler can migrate it or so that you as the user can checkpoint or migrate it by a command, use the following:

```
% bsub -k /scratch08/dlclams/chk clamprep
```

Once a checkpointable job is running, it can be checkpointed using the `bchkpnt` command, or it can be checkpointed and migrated using the `bmig` command. The `brestart` command is used to restart from a checkpoint. Please see the man pages or manuals for further details.

### LSF Utilities

There are many other utilities that may be useful but are not as critical to getting started with LSF and so shouldn't consume space in this introductory article. Listed below are some of the more commonly used LSF utilities and a brief description of their uses.

- `lstcsh`: a load sharing version of the popular `tcsh` UNIX shell that runs interactive commands remotely with full transparency.
- `lsmake`: a distributed make facility that runs tasks on many hosts in parallel, reducing response times of software building.
- `lstools`: a tool kit of utility programs that sends tasks to the best hosts for execution, runs commands on many hosts simultaneously, provides system resources and load information, etc.

- **Isload:** one of the most used lstools which provides a listing of the loads on each participating node in a cluster; Isload -l includes all of the customized indices along with the standard ones.
- **Islogin:** load sharing version of rlogin that selects the least loaded node to start a login session.
- **lspvmrm:** a load sharing interactive scheduler for the parallel application package, PVM.
- **xlsmon:** a Motif-based GUI for cluster load monitoring.

#### **LSF Contact Information**

For help with LSF on the LANL machines, please contact Doug Lora at [dlora@lanl.gov](mailto:dlora@lanl.gov) or 665-3321.

For help from Platform Computing contact

Platform Computing Corporation  
5001 Yonge St. #1401  
North York, ON, M2N 6P6  
Canada  
Tel +1 (416) 512-9587  
FAX +1 (416) 512-8976  
e-mail [info@platform.com](mailto:info@platform.com)  
www <http://www.platform.com>

*Doug Lora, [dlora@lanl.gov](mailto:dlora@lanl.gov), (505) 665-3321  
Computing Group (CIC-7)*

## Using Filters in Eudora

Remember when e-mail was actually a useful and unobtrusive tool? When you only received e-mail from your friends and co-workers, only e-mail you were interested in? Well, those days are gone now. With the explosion of the number of people who use e-mail and the widespread use of e-mail lists, most of us now get more e-mail than we know what to do with. The use of e-mail filters can help us to make some order out of the deluge. (Note that the Filter option is not available in the freeware, "Eudora Lite" versions, only the commercial version contains Filters.)

### What Is an E-Mail Filter

To use filters, you need to first create different categories for your e-mail. In Eudora, you organize your mail through the use of separate, individual mailboxes that you make. The most common use of filters is to move e-mail messages to mailboxes or assign them to categories based on the "To:" header. For instance, you can create a mailbox called "CIC Stuff" and have a filter that looks for e-mail sent to "cic-all" and transfers the e-mail to that mailbox.

### Creating Filters

To use filters, you will need to create mailboxes. By default, you have the In, Out, and Trash mailboxes. To create a new mailbox, you can

- select New... under the Mailbox menu,

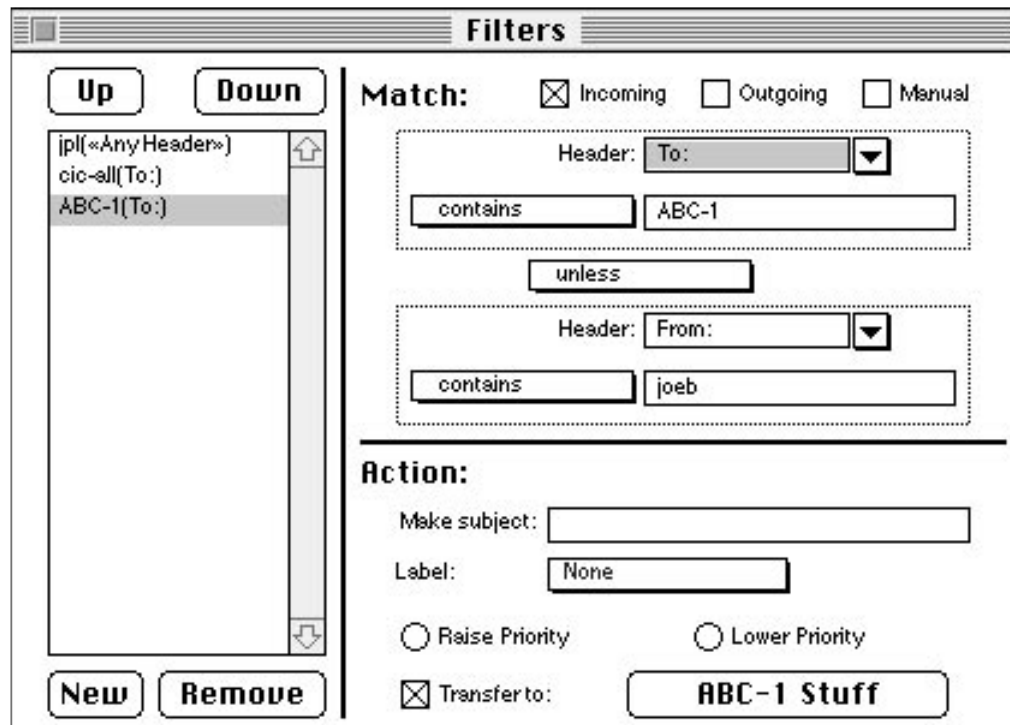
- select an individual e-mail and select New... under the Transfer menu (which would transfer that e-mail to the newly created mailbox), or
- create the mailbox in the filter building process.

(If you end up with a lot of mailboxes, you can create mailbox folders to help organize them).

To get started with Filters, select Filters from the Eudora Windows menu. You will then be presented with the Filters window. (See the illustration below.) Now, there are many ingenious and various filters you could create. However, 95% of the filters most people use are of the "look in the header and transfer the e-mail to a specific mailbox" variety.

### The Match Criteria

The first step in creating a filter once you have the Filters window is to click on the New button. (Eudora will name the filter, so you do not need to worry about coming up with a name.) There are two parts of the filter: Match and Action. In the Match part, you first decide on whether to filter Incoming messages (the default), Outgoing messages, or Manual. You could use an Outgoing filter to transfer the copies Eudora makes of all your messages sent to a specific person to a specific mailbox instead of the default Out mailbox, for instance. The Manual selection allows you to filter messages manually by selecting Filter Messages from the Special menu.



*The Eudora Filters Window*

This Manual filter feature is useful for testing new filters or to filter messages you have already received in your In mailbox. Say, for example, you subscribed to a mail list, came in Monday morning, and found 200 new messages in your In mailbox. You could create a manual filter that looks for the name of that mail list sender in the From: heading and moves the e-mail messages to a mailbox for that mail list. A point you need to remember about manual filters is that you need to select the messages first before you run the Filter Messages command.

The next section within Match allows you to select one or two “terms” as filtering criteria. You get to choose where Eudora looks for a match from the Header pull-down menu. You can choose To:, Cc:, From:, Subject:, Reply-To:, Any Header, or characters in the Body of the e-mail message. You then select a search action in the next pull-down menu. The choices are as follows: contains, does not contain, is, is not, starts with, ends with, appears, or does not appear. Most of these “choices” search for substrings: joebl@lanl.gov contains joebl, for example. The “is/is not” selections imply an exact match, such as if the From: header is joebl@lanl.gov. The “appears/does not appear” selections refer to whether a type of heading appears at all (or does not appear). For example, you could create a filter term that looks to see if e-mail has a Subject: field at all (that is if the Subject: field appears). These two search actions do not search for any specific text, only the existence of a particular field.

And, if needed, you could create search terms with a Boolean operator between them: ignore (the default, meaning there is not a second term), and, or, or unless.

Now, take heart. You will probably never use most of these choices and it is easier than my description makes it seem. In the example below, we search for messages in which the To: field contains ABC-1@lanl.gov. (This would find all the e-mail addressed to the mythical ABC-1 group.) But if the e-mail is from our friend Joe, then we know it is special and don’t want to send it to the ABC-1 mailbox with all the other e-mail. So we add unless From: contains joebl@lanl.gov. Most filters will contain only one term—that is if the To: field is addressed to a certain mail list, such as cic-all. But you could get very creative and complicated with filter constructions, if needed.

### The Filter Action

Once you set up the match criteria for the filter, you then tell Eudora what you want the filter to do. In most cases, you click on the Transfer to: box. You are then asked to pick a

mailbox to transfer the filtered e-mail messages to by pulling down the Transfer menu and selecting a mailbox. If you have not yet created the appropriate mailbox, you can select the New... mailbox selection. (If you really don’t like certain e-mail, you could even filter it to the Trash mailbox.)

However, there are other actions you could have done. You could also change the Subject: to something else. You could raise or lower the priority of an e-mail message. (This adds various chevrons to the left of a message summary in the mailbox.) Or, you could assign a Label to certain messages, which would make those message summaries the color you chose in the Label pull-down menu.

When you are finished creating new filters, click on the close box (the upper left corner of the Filters window). You will then be asked if you want to save your changes (which you would usually answer Yes).

Filters are invoked in the order they are listed in the Filters window. You can change the order of a filter by highlighting the name of that filter and clicking on the Up or Down buttons.

When you receive filtered messages, if the “Open mailbox (new mail only)” selection is checked in the Getting Attention section of Eudora’s Settings, the Mailboxes where the filtered e-mail was sent will automatically open. If this selection is not checked, you will get a Filter Report telling you where the filtered e-mail went. (When you pull the Mailbox menu down, the mailboxes having unread mail in them are underlined in the menu.)

### A Great Filter Idea

If you are like me, you get a lot of e-mail. To separate the messages specifically for me, I created a filter that looks just for my specific e-mail address (jpl) in any header and have it transfer the e-mail to a John’s In mailbox. This way, I can look at that one mailbox and see all the e-mail that was addressed specifically to me. (That still does not mean that I will have time to answer all the e-mail messages, unfortunately.)

### Conclusion

Filters are so useful that everyone who gets more than a few e-mail messages a day should use them. They help stem the rushing tide of e-mail that we seem to be deluged with these days.

For help with Eudora on the Mac, call 665-1361; for the PC, call 667-5884.

*John Layne, jpl@lanl.gov, (505) 665-5090  
Desktop Group (CIC-2)*

**LANL Research Library Training**

The LANL Research Library provides training for using its specialized databases. Training sessions begin at times indicated below. Classes are scheduled for half an hour, except for "Information Sources on the Internet via WWW" which is two hours. Space is limited to 8 per session. Classes are free, but you must pre-register by calling the Research Desk at 7-5809 or sending e-mail to [library@lanl.gov](mailto:library@lanl.gov). Special classes and orientations can also be arranged.

| Date     | Time       | Subject Matter                                          |
|----------|------------|---------------------------------------------------------|
| 11-2-95  | 2:00 p.m.  | Information Sources on the Internet via WWW             |
| 11-7-95  | 1:00 p.m.  | Science Citation Index, WWW version                     |
| 11-9-95  | 1:00 p.m.  | Commercial Information for Patent Applications          |
| 11-14-95 | 1:00 p.m.  | Finding Unclassified and Classified Report Literature   |
| 11-15-95 | 11:00 p.m. | MELVYL (University of California specialized databases) |
| 11-21-95 | 1:00 p.m.  | Commercial Information for Patent Applications          |
| 11-28-95 | 1:00 p.m.  | Science Sources on the WWW                              |
| 11-30-95 | 1:00 p.m.  | Science Citation Index, WWW version                     |
| 11-30-95 | 2:00 p.m.  | Information Sources on the Internet via WWW             |

## Lab-Wide Systems Training

The Customer Service Group (CIC-6) offers training for users of Laboratory information systems. The CIC-6 courses offer training for a variety of personnel including property administrators, group secretaries, training coordinators, budget analysts, group leaders, or anyone needing to access training records, property records, costs, employee information, travel, chemical inventories, etc. Refer to the table below and on the following pages for specific information about courses currently offered.

### Course Registration

You must have a valid ICN password before taking any of the courses shown in the table. To register for a course, call CIC-6 Training, Development, and Coordination section at 667-9444. You will be sent a registration form to be completed and returned.

| Course Title                                                  | Date                                                                                                                                                                                                                                                                                                                                      | Time         | Cost  | Course Number |
|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------|---------------|
| <b>Administrative ToolKit</b>                                 | 11/16/95                                                                                                                                                                                                                                                                                                                                  | 1:15 - 4:45  | \$260 | Course #11395 |
|                                                               | A combination of the Directory Information, Signature Authority, TRIPS, and STORES system classes. The student will learn how to update directory information, assign signature authorities (purchase, SIGMA, etc.), submit travel requests, and purchase materials on-line. Reporting and printing for each system will also be covered. |              |       |               |
| <b>Automated Chemical Inventory System (ACIS):</b>            | Scheduled Upon Request                                                                                                                                                                                                                                                                                                                    |              | \$260 | Course #7480  |
|                                                               | Participants receive hands-on instruction to update the status (end-user, location, quantity) of chemical containers. Participants will also learn to generate chemical inventory reports by chemical name, end-user, location, and organization.                                                                                         |              |       |               |
| <b>Budget Computing System (BUCS):</b>                        | Scheduled Upon Request                                                                                                                                                                                                                                                                                                                    |              | \$260 | Course #3527  |
|                                                               | This training is an introduction to the Budget Computing System (BUCS). Students practice generating "quick reports" and reports requiring parameter files. An introduction and demonstration of (no "hands-on") allocating procedures are given during the three-hour session.                                                           |              |       |               |
| <b>Employee Development System - Basic Training (EDS I):</b>  | 11/15/95                                                                                                                                                                                                                                                                                                                                  | 1:15 - 4:45  | \$260 | Course #5289  |
|                                                               | The course provides hands-on instruction to request course enrollment, use the on-line course catalog, retrieve training transcripts, and assign EDS authorities. The student will learn to create courses, add students to the courses, and generate several training reports.                                                           |              |       |               |
| <b>Employee Development System - Training Plans (EDS II):</b> | 11/22/95                                                                                                                                                                                                                                                                                                                                  | 8:30 - 12:00 | \$260 | Course #7155  |
|                                                               | Participants receive hands-on instruction to create and maintain training plans, assign assignment codes, and generate training plan reports. Attendees must have prior training in the Employee Development System (course #5289).                                                                                                       |              |       |               |
| <b>Eudora Electronic Mail</b>                                 | 11/9/95                                                                                                                                                                                                                                                                                                                                   | 8:30 - 10:30 | \$130 | Course #9762  |
|                                                               | This class is a hands-on class that teaches the participant how to use Eudora software to create, send, receive, and edit electronic mail messages. In addition to these procedures, the participant will learn what related settings mean and how to configure the system to meet his or her individual needs.                           |              |       |               |
| <b>Financial Reporting System</b>                             | 11/14/95                                                                                                                                                                                                                                                                                                                                  | 8:30 - 11:30 | \$260 | Course #11050 |
|                                                               | Students will receive hands-on training to generate standard financial reports and make on-line queries from information in the "data warehouse," a collection of data from Laboratory budgeting, accounting, and time-keeping systems.                                                                                                   |              |       |               |

| Course Title                                                                                  | Date                                                                                                                                                                                                                                                                                                                                                                            | Time                | Cost         | Course Number        |
|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------|----------------------|
| <b>Facilities Project Information/Work Orders (FPI/WO):</b>                                   | <b>Scheduled Upon Request</b>                                                                                                                                                                                                                                                                                                                                                   |                     | <b>\$260</b> | <b>Course #6996</b>  |
|                                                                                               | Lab-wide users with a need to view the status of work orders and tickets in their organizations will receive hands-on instruction to request, print, and review work order, ticket and project summary information reports.                                                                                                                                                     |                     |              |                      |
| <b>Financial Management Information System (FMIS):</b>                                        | <b>11/7/95</b>                                                                                                                                                                                                                                                                                                                                                                  | <b>8:30-12:00</b>   | <b>\$260</b> | <b>Course #8338</b>  |
|                                                                                               | Participants receive hands-on instruction to "explode" and "transfer" through the costs, allocations, and outstanding commitments screens. In addition, participants will create/review reports, access the Information Manager Utility for printing reports, and learn how to assign authorities in the system.                                                                |                     |              |                      |
| <b>Hazardous Materials Transfer Tracking System for Nonradioactive Material (HMTTS/NRAM):</b> | <b>Scheduled upon request</b>                                                                                                                                                                                                                                                                                                                                                   |                     | <b>\$260</b> | <b>Course # 7907</b> |
|                                                                                               | Participants receive hands-on instruction to create, update, and print the non-RAM Hazardous Materials Transfer Form (HMTF). Attendees must have completed "Completing the HMTF for Non-RAM," course #7512, sponsored by HS-8.                                                                                                                                                  |                     |              |                      |
| <b>Hazardous Materials Transfer Tracking System for Radioactive Material (HMTTS/RAM):</b>     | <b>Scheduled Upon Request</b>                                                                                                                                                                                                                                                                                                                                                   |                     | <b>\$260</b> | <b>Course #7993</b>  |
|                                                                                               | Participants receive hands-on instruction to create, update, and print the Radioactive Materials Transfer Form (RMTF). Information about the non-RAM Hazardous Materials Transfer Form (HMTF) is included. This course is appropriate for people who fill out both RAM and Non-RAM forms. Attendees must have completed "Completing the RMTF," course #7517, sponsored by HS-8. |                     |              |                      |
| <b>Introduction to the Internet: Beginning Netscape</b>                                       | <b>11/28/95</b>                                                                                                                                                                                                                                                                                                                                                                 | <b>8:30 – 10:30</b> | <b>\$130</b> | <b>Course #10961</b> |
|                                                                                               | Students gain basic understanding of the Internet and the World Wide Web and the use of Netscape as a browser to surf the Net. Topics covered are both Laboratory sites and open sites, along with practical uses of the Internet.                                                                                                                                              |                     |              |                      |
| <b>Introduction to LANL Information Systems</b>                                               | <b>11/30/95</b>                                                                                                                                                                                                                                                                                                                                                                 | <b>1:30 – 3:30</b>  | <b>Free</b>  | <b>Course #10118</b> |
|                                                                                               | This three-hour class is a hands-on introduction to the information systems available to Laboratory-wide users. The participants will become acquainted with Lab-wide information systems such as TRIPS and Stores, Electronic Mail, and Netscape (an interface to Laboratory information).                                                                                     |                     |              |                      |
| <b>Key/Core System</b>                                                                        | <b>11/27/95</b>                                                                                                                                                                                                                                                                                                                                                                 | <b>1:30 – 3:30</b>  | <b>\$130</b> | <b>Course #10179</b> |
|                                                                                               | Key custodians and alternate key custodians receive hands-on instruction to add, update, and delete key and padlock information, and view assignment information and request reports. Students will also learn how to request key inventory notifications. Students must be a key custodian or alternate and have an ICN password.                                              |                     |              |                      |
| <b>Lotus Notes Basic Concepts</b>                                                             | <b>Scheduled Upon Request</b>                                                                                                                                                                                                                                                                                                                                                   |                     | <b>\$260</b> | <b>Course #9917</b>  |
|                                                                                               | This class provides hands-on instruction for Mac and PC users to use Lotus Notes software to create and send E-mail memos; fax documents; search databases; create filters, nicknames, banners, and doclinks; set defaults; and use multiple address books. In addition, participants learn how to use the memo, meetings, and discussion databases.                            |                     |              |                      |
| <b>On-Line Forms</b>                                                                          | <b>11/21/95</b>                                                                                                                                                                                                                                                                                                                                                                 | <b>1:15 – 3:15</b>  | <b>\$130</b> | <b>Course #9756</b>  |
|                                                                                               | Participants will learn to use Netscape software to access Lab-wide information and forms. Using Jetform Filler software, participants will access, complete, and print forms such as the "ICN Validation Request," "Visitor Request for Unclassified Visits to Security Areas," and "Request                                                                                   |                     |              |                      |

| Course Title                                                                                                                                                                                                                                                                                                                                                     | Date                   | Time         | Cost  | Course Number |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|-------|---------------|
| Property Accounting, Inventory, and Reporting System (Advanced)                                                                                                                                                                                                                                                                                                  | Scheduled upon request |              | \$260 | Course #9918  |
| This course will include a refresher of PAIRS, advanced techniques and tips, explanation of the notification system, and report capabilities. Swap Shop, Loan Out information, and support tables will be discussed. Participants should already have a basic understanding of and know how to use PAIRS.                                                        |                        |              |       |               |
| Salary Review System                                                                                                                                                                                                                                                                                                                                             | 11/15/95               | 8:30 - 12:00 | \$260 | Course #3528  |
| Hands-on instruction is provided for controlling write access, distributing salary increase authorization funds, working with roster worksheets to propose individual raises, and producing both standard and customized reports.                                                                                                                                |                        |              |       |               |
| Secretarial/Contract Services (SE):                                                                                                                                                                                                                                                                                                                              | Scheduled upon request |              | \$260 | Course #7481  |
| This class provides hands-on instruction for creating secretarial requests for temporary services, entering time for technical and nontechnical contract employees, and creating reports using the Information Manager Utility. The students will also learn how to review notifications and approve attendance. A training database will be used for the class. |                        |              |       |               |
| Time and Effort System                                                                                                                                                                                                                                                                                                                                           | 11/29/95               | 1:30 – 4:30  | \$260 | Course #11018 |
| The student will learn how to enter attendance, amend attendance, approve attendance, and submit exception and approval reports. Time codes and associated policies will also be discussed. In addition, the student will learn how to use the Information Manager utility to view and print reports.                                                            |                        |              |       |               |

## CIC Computing Classes

CIC offers a variety of computing courses for the professional development of Laboratory employees. The courses listed in Table 1 will meet at the time and the date shown. The date for courses in Table 2 are not known at this time.

## Course Registration

To register: (1) check the box beside the appropriate course, (2) complete the Enrollment Information section below, and (3) follow the mailing instructions on the back of this form. Submittal of a Course Registration form does not guarantee participation in an advertised class, but it is the only way to get into the queue for notification of upcoming classes. Classes are conducted in a secure area unless noted; uncleared participants require escorts. Call the Training Coordinator at 667-9399 for more information.

**Table 1 Courses with confirmed time and date**

| COURSE TITLE                                                                                    | INSTRUCTOR                            | COST                                         | DATES                                   |
|-------------------------------------------------------------------------------------------------|---------------------------------------|----------------------------------------------|-----------------------------------------|
| <input type="checkbox"/> C Programming (Beginning)                                              | Michael Chase, Boulder Software Group | \$780-\$1100 (depending on enrollment)       | 1/8/96 through 1/12/96                  |
| <input type="checkbox"/> Common Object Request Broker Architecture (CORBA)                      | IONA expert                           | \$914.50-\$1247.50 (depending on enrollment) | Early Jan. (3-day class)                |
| <input type="checkbox"/> Parallel Programming Workshop for the PowerParallel (SP2) System (IBM) | IBM System Administration Expert      | \$1400-\$1900 (depending on enrollment)      | Jan. (4-day class)                      |
| <input type="checkbox"/> SUN Solaris 2.X System Administration                                  | Jon Nouveaux, Sun Microsystems Expert | \$1750-\$2000 (depending on enrollment)      | 1/15/96 through 1/19/95 (4.5-day class) |
| <input type="checkbox"/> UNIX (Beginning)                                                       | Ted Spitzmiller & Jeffrey Johnson     | \$810                                        | 11/27/95 through 11/31/95               |

**Table 2 Courses with date to be arranged (TBA)**

| COURSE TITLE                                                                        | INSTRUCTOR              | COST                                    | DATES               |
|-------------------------------------------------------------------------------------|-------------------------|-----------------------------------------|---------------------|
| <input type="checkbox"/> C Programming (Advanced)                                   | Boulder Software Group  | \$780-\$1150 (depending on enrollment)  | TBA (5-day class)   |
| <input type="checkbox"/> SUN Solaris 1.X (SunOS 4.X) Advanced System Administration | Sun Microsystems Expert | \$1750-\$2000 (depending on enrollment) | TBA (4.5-day class) |

Note: Detailed course descriptions for most classes provided on the following pages.

### Enrollment Information

Name \_\_\_\_\_

Phone \_\_\_\_\_ Z-Number \_\_\_\_\_

Group \_\_\_\_\_ Mail Stop \_\_\_\_\_

Program Code\* \_\_\_\_\_ Cost Code\* \_\_\_\_\_

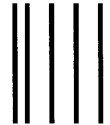
Group Leader Signature \_\_\_\_\_

*\*Enter program code and cost code for all courses. If you need to withdraw from a class fewer than 5 working days before the class is scheduled to begin, your group will still be charged. Substitutes may be sent, but please let the CIC Division Training, Development, and Coordination Office (667-9399) know who your substitute will be.*

---

Do Not Staple  
Fold on This Line First

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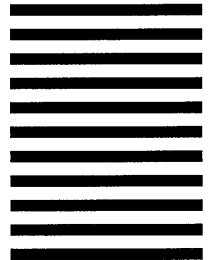
NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

**BUSINESS REPLY MAIL**

FIRST-CLASS MAIL PERMIT NO. 88 LOS ALAMOS NM

POSTAGE WILL BE PAID BY THE ADDRESSEE

MAIL STOP B296  
CIC DIVISION TRAINING DEVELOPMENT  
AND COORDINATION TEAM  
LOS ALAMOS NATIONAL LABORATORY  
PO BOX 1663  
LOS ALAMOS NM 87544-9916



---

Do Not Staple, Seal with Tape  
Fold Here

**C Programming (Beginning)**

Prerequisite: An understanding of the useful skills in a high-level programming language. A current ICN password is required.

Location: CIC-Division Classroom, TA-3, SM-200, Room 210 (secure area).

Enrollment: Minimum 10, Maximum 16.

Topics: Introduction and Fundamentals; Basic Semantic Constructs—Getting Started; Base Level I/O with C; The Preprocess-Compilation Environment; Operators, Data Types, and Storage Classes; Control Flow Constructs; Conditional Constructs; Higher-Level Data Constructs in C; File I/O; UNIX Software Tools; and POSIX System Calls.

**C Programming (Advanced)**

Prerequisite: Useful skills and experience with the C Programming language.

Location: CIC-Division Classroom, TA-3, SM-200, Room 210 (secure area).

Enrollment: Minimum 10, Maximum 16.

Topics: Data Structures, Algorithms, and OOP; An Advanced Clinic for C Programmers; The ANSI C Recommendation X3.159; C and ANSI C War Stories; The Data Structure and the Assessment of Algorithms; Arrays; Structures; Unions; Stacks; Queues; Linked Lists; Recursive Functions; Binary Trees; Hashing; File Organizations Using the C Runtime Library; Standard Interprocess Communication Mechanisms; An Introduction and Overview of AT&T's C++ 3.0; and Appendix: references for periodicals, journals and texts.

**Common Object Request Broker Architecture (CORBA)**

Prerequisite: Familiarity with client/server environment; distributed, integrated applications; and object oriented technology tools.

Location: CIC-CTI Classroom; TA-3, SM-200, Room 115.

Enrollment: Minimum 10, Maximum 16.

Audience: Individuals interested in developing distributed, integrated applications using the CORBA software.

Topics: CORBA (A strategic overview, CORBA as a strategy, CORBA as a standard, CORBA as a development tool); The future of CORBA (CORBA/OLE interoperability, ORB interoperability, CORBA services, CORBA facilities); Technical introduction to CORBA (Components of CORBA, Worked Examples Using CORBA: Stubs (Static Invocation Interface), CORBA/OLE interoperability, CORBA and databases, CORBA and fault tolerant computing); ORB interoperability; Universal Networked Objects (UNOs); Internet Interoperability Protocol (IIOP); The Dynamic Skeleton Interface (DSI); and Bridges.

**Parallel Programming Workshop for the PowerParallel (SP2) System (IBM)**

Prerequisite: No prior knowledge of parallel programming required; some development experience in UNIX and in at least one of Fortran, C, or C++ is required.

Location: CIC-CTI Classroom; TA-3, SM-200, Room 115.

Enrollment: Minimum 10, Maximum 16.

Topics: Introduction to Parallel Programming (Definitions, Parallel Architectures and Algorithms, Parallel Programming Approaches, Program Partitioning and Mapping, Important Issues, Applications); SP2 System Overview; SP2 Parallel Environment (Overview, Compilers, Resource Management - partition manager, Parallel Program Visualization, Profiling Parallel Programs, Message Passing Library (MPL)); Parallel Virtual Machine Extended (PVMe); Parallel Programming Workshop (predetermined labs of varying difficulty; in language of choice); and Optional Topics (Parallel Databases, Parallel I/O).

### UNIX (Beginning)

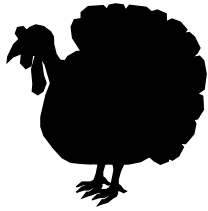
Prerequisite: Familiarity with a UNIX workstation.

Location: CIC-Division Classroom, TA-3, SM-200, Room 210 (secure area).

Enrollment: Minimum 8, Maximum 10.

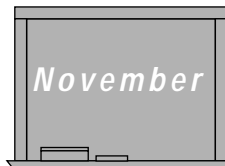
Topics: Overview of the Workstation environment; Getting Started; The UNIX File System; Manipulating Files; Customizing Your Environment; The C-Shell; Editing and Writing with vi; Using the Network; Discussing NFS and NIS; Using basic system status commands; Startup and shutdown procedures; Using tar.

## ICNchanges Contents




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### Schedule for Change Control

| Date                                                                                | Activity                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| November 7<br>(First Tuesday)                                                       | New or changed software is available in experimental ( <b>X</b> ) files on CFS for testing. This initial testing period is for uncovering problems in the software before the software is put into production. If you find a problem, please call the ICN Consulting Office at (505) 667-5746. |
| November 14<br>(Second Tuesday)                                                     | The changes become production version on <ul style="list-style-type: none"> <li>• Machines <b>epsilon</b>, <b>rho</b>, and <b>zeta</b> (UNICOS)</li> <li>• Distributed processor <b>beta</b> (AIX)</li> <li>• Distributed processor <b>ccvax</b> (VMS)</li> </ul>                              |
| November 21<br>(Third Tuesday)                                                      | If no problems are reported to the ICN Consulting Office (505) 667-5746, changes are installed on <ul style="list-style-type: none"> <li>• Machines <b>delta</b> and <b>gamma</b> (UNICOS)</li> </ul>                                                                                          |
|  | The freeze on the secure ICN has been lifted. All backlogged changes have been installed. New changes will follow the secure ICN Configuration Management Plan before being installed.                                                                                                         |

Note: A stop sign in front of a title is significant:



= incompatible changes; please read!

## Editor's Note

Beginning with the February 1996 issue, ICNchanges will no longer be available in hard copy or published in the *BITS: Computing & Communications News*. Information about Change Control will continue to be available as it is today by linking to the following Web page:

**<http://www.lanl.gov/computer-information/ICNchanges>**

Please try this link and if you have any suggestions or comments contact Bob Ayars (DDCIC) at (505) 667-9047 or **[rsa@lanl.gov](mailto:rsa@lanl.gov)**. After January 1, 1996 the changes will be announced by e-mail. If you want to be added to the Change Control e-mail list contact Barbara Ritchie at (505) 667-7275 or **[bxr@lanl.gov](mailto:bxr@lanl.gov)** to be notified as information about changes becomes available on the Web.

## Deletions

This section lists utilities and services that are targeted for deletion or have already been removed from the systems listed.



### DELETIONS (UNICOS)

These tools are being removed from all UNICOS systems during the December 1995 Change Control cycle. For more details please see the Feature Articles section in the October 1995 issue of *BITS*.

**ARCHIVE**  
**CGM Library**  
**DEARCHIVE**  
**INDEX**  
**MVI**

**OLD NCAR**  
**RASVIEW**  
**TIDY**  
**TOP**

**VT2HOST**  
**VT2PC**  
**VTOUT**  
**XEQ**

**GAS** — third party software — support will be available as noted on the **support** man page.

## Network Services Information

This section provides information and a record of changes to the software and hardware that make up the ICN network and the services it provides. If you detect a problem, please call the ICN Consulting Office at (505) 667-5746, or send electronic mail to **consult@lanl.gov**.



### Network Support Team (NST)

The Network Support Team (NST) was formed by combining the CIC-4 Network Control Center (NCC) and the CIC-5 Network Operation Center (NOC). The NST is located in Group CIC-5.

On November 20, 1995 the NST that operates the trouble desk and answers (505) 667-7423 will be changing its hours of operation. The trouble desk has been staffed from 6:00 a.m. to 6:00 p.m.; the hours will change to 7:00 a.m. to 5:00 p.m. Trouble calls outside of those hours of operation will be handled by on-call personnel. Callers to (505) 667-7423 after 5:00 p.m. or on weekends will get prompted with a voice message to call (505) 667-4584, the Central Computing Facility (CCF) dispatch desk or to leave a voice message if the problem can wait until the next business day. The CCF personnel will determine the type of problem and who to call in to fix the problem.

Network and communication problems can also be reported by e-mail to **noc@lanl.gov**.

After hours, users can expect a one-hour response time. The on-call person may call the user to get a full understanding of the problem. The one-hour time frame allows for commute time to Los Alamos if necessary.

The reduced coverage is being implemented because few calls are being received by the NST trouble desk after 5:00 p.m. and before 7:00 a.m.

For further information, please contact Bob Hoffman (CIC-5) at (505) 667-7995 or **rhoffman@lanl.gov**.

## System Information

This section provides information and a record of changes to the ICN operating systems. When changes are announced here, they may already be included in the production versions of the indicated operating systems and machines. Most of the changes are strictly internal to the systems and should not affect users. However, if you detect a problem, please call the ICN Consulting Office at (505) 667-5746, or send electronic mail to **consult@lanl.gov**.

### Secure CM200

In late November, secure UNICOS Machines Delta and Epsilon will no longer be available for staging files to/from CFS, because the IP HIPPI will be activated on those machines. For many reasons, the CM200's can not use the IP protocol over HIPPI channels.

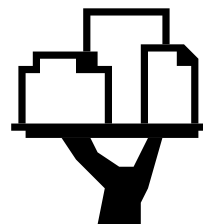
Secure Machine Tau will take the place of **delta** and **epsilon** as a staging platform. Although **tau** will also have IP HIPPI active, **tau** has two HIPPI channels; one that will be used for CM200 to/from **tau** HIPPI communications.

If you are an active user of the secure CM200 machines, an account on **tau** will be established for you by mid-November.

*Randy Bremmer (CIC-7) 505-667-5820*

*Velda Volz (CIC-7) 505-667-0602*

*John Cerutti (XHM) 505-667-0378*



## Information About Change Control

ICN Change Control is the set of procedures that coordinates changes in the ICN to ensure quality control and smooth operation and to avoid introducing additional problems. In an environment as dynamic as the ICN, control must be imposed on the scope and timing of changes that involve many components. Please report any problems as soon as they occur by calling the ICN Consulting Office at (505) 667-5746.

The following CFS nodes are used for software that is maintained or announced through Change Control procedures. The files under **/ccx(s)/unicos** are deleted the last Friday of each month because these experimental versions become the production versions on all machines by the third Tuesday of the month. The other nodes keep the most recent versions of their respective software.

|                    |                                      |
|--------------------|--------------------------------------|
| Non-UNICOS Systems | <i>/cc-node/platform/filename</i>    |
| UNICOS Systems     | <i>/cc-node/unicos/type/filename</i> |

Where *cc-node* is:

|             |                                                                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ccx</b>  | Open change-control root node<br>examples: <b>/ccx/mac/ppages</b><br><b>/ccx/unicos/bin7/ppagesx</b><br><b>/ccx/unicos/ubin7c/tedix</b><br><b>/ccx/vax/ppages.bak</b> |
| <b>ccxs</b> | Secure change-control root node<br>examples: <b>/ccxs/unicos/lib8/libcftlib.a</b><br><b>/ccxs/sun/ppages.tar</b>                                                      |

Where *platform* is:

|                   |                                                                                    |
|-------------------|------------------------------------------------------------------------------------|
| <b>aix</b>        | current executables for IBM RS6000-370 with AIX OS on Beta                         |
| <b>alpha_osf</b>  | tar files for DEC Alpha OSF/1 machines                                             |
| <b>alpha_vms</b>  | backup save sets for DEC Alpha VMS machines                                        |
| <b>convex</b>     | tar files for Convex machines                                                      |
| <b>dec_risc</b>   | tar files for DEC RISC workstations                                                |
| <b>dos</b>        | executables ( <b>.exe</b> ) for PC/DOS machines                                    |
| <b>hp</b>         | tar files for Hewlett-Packard workstations                                         |
| <b>ibm_rs6000</b> | tar files for IBM RS6000 workstations                                              |
| <b>mac</b>        | binhex ( <b>.hqx</b> ) or MacBinary ( <b>.mbin</b> ) files for Macintosh computers |
| <b>next</b>       | tar files for NeXT workstations                                                    |
| <b>sgi</b>        | tar files for Silicon Graphics workstations                                        |
| <b>solaris</b>    | tar files for Sun Solaris workstations                                             |
| <b>sun</b>        | tar files for Sun OS workstation                                                   |
| <b>unicos</b>     | executable <b>X</b> files or library files for current Change Control cycle        |
| <b>vax</b>        | backup-save-sets for VAX/VMS systems                                               |

Where *filenames* are:

Where *type* is:

|             |                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------|
| <b>bin#</b> | binary files for version # of the operating system; note that an "x" is appended to the binary filenames |
| <b>lib#</b> | library files for version # of the operating system                                                      |
| <b>u</b>    | user-supported executable files ( <b>ex</b> , <b>ubin</b> , <b>ulib</b> , <b>udata</b> , <b>usys</b> )   |

If problems are discovered during the cycle, defective hardware or software is corrected, replaced, removed, or backed off.

## Online Information

You can access complete online information about Change Control by linking to the following Web page:

**<http://www.lanl.gov/computer-information/ICNchanges>**

The Web page includes this menu:

Keyword Search of all ICNchanges (?)

Current (*month year*)

1995 Archives

1994 Archives

1993 Archives

1992 Archives

1991 Archives

Once you select a particular issue of ICNchanges, you then select which of these formats to use for viewing the articles:

ICNchanges - ASCII Version

ICNchanges - HTML Version

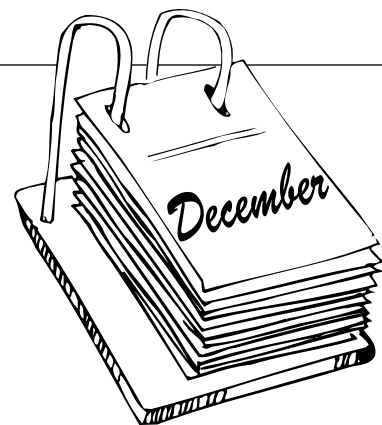
ICNchanges - Acrobat Version

ICNchanges - PostScript Version

*Barbara Ritchie ([bxr@lanl.gov](mailto:bxr@lanl.gov)), (505) 667-7275*  
*Communication Arts and Services (CIC-1)*

## DECEMBER DEADLINE

The deadline for articles for the December 1995 Change Control is 8:00 am, Wednesday, November 15, 1995. Please submit items to Barbara Ritchie at **[bxr@lanl.gov](mailto:bxr@lanl.gov)**.



## CCF Machine Availability and Downtime

| Machine Name(s) | Machine Type            | Operating System | Security Partition | System Availability (September 1995) | Scheduled Downtime*     |
|-----------------|-------------------------|------------------|--------------------|--------------------------------------|-------------------------|
| delta           | CRAY Y-MP8/8-128        | UNICOS 7.0       | Secure             | 98.5                                 | None                    |
| epsilon         | CRAY Y-MP8/8-128        | UNICOS 7.0       | Secure             | 99.1                                 | None                    |
| rho             | CRAY Y-MP8/8-64         | UNICOS 8.0       | Open               | 97.0                                 | November 1 — 0400-0700  |
| zeta            | CRAY Y-MP8/2-64         | UNICOS 8.0       | Secure             | 98.7                                 | None                    |
| gamma           | CRAY Y-MP/M98-82048     | UNICOS 8.0       | Open               | 99.7                                 | November 15 — 0400-0700 |
| sigma**         | CRAY T94/4-128-2        | UNICOS 9.0       | Secure             |                                      | November 8 — 0400-0700  |
| tau**           | CRAY T3D MC512-8        | MAX 1.2          | Secure             | 98.5                                 | November 22 — 0400-0700 |
|                 | CRAY Y-MP4I/464-2       | UNICOS 8.0       |                    |                                      |                         |
| pi**            | CRAY Y-MP EL92/1-256    | UNICOS 8.0       | Open               | 100%                                 |                         |
| cluster         | IBM Workstation Cluster | AIX              | Open               |                                      |                         |
| beta            | IBM RS6000-370          | AIX              | Open               |                                      |                         |
| ccvax           | VAX 6410                | VMS              | Open               |                                      |                         |
| canyon          | VAX 6410                | VMS              | Open               |                                      |                         |
| pobox1663       | Sparc 20                | Sun OS 4.1.4     | Open               |                                      |                         |
| canyon          | TMC CM200               | SunOS            | Secure             |                                      |                         |
| tres            | TMC CM200               | SunOS            | Secure             |                                      |                         |

\* Additional downtime for the Cray machines may occur as a result of Network Dedicated Systems Time (NDST). The schedule for possible NDST is from 0600-0700 Mountain Time, Monday through Thursday. Should NDST become necessary, a message listing the scheduled downtime will be broadcast on the applicable machines before the actual downtime occurs. For additional information contact the shift supervisor at (505) 667-4584. All times listed are Mountain Time.

\*\* Access restricted.

## Questions About Announced Changes?

Notice of all scheduled downtime will be broadcast on the machine before the downtime. For up-to-date machine status and scheduled downtime call: CCF Status Message (505) 667-5588.

## Publication Information

ICNchanges Editor/Publication Coordinator  
Barbara Ritchie (CIC-1)  
Mail Stop B295  
Telephone (505) 667-7275

Change Control Coordinator  
Marjorie Sigler (CIC-6)  
Mail Stop B252  
Telephone (505) 667-7309

## Accessing Computing Machines through the ICN

*This table shows how to access open machines on the ICN through MICOM lines, TCP/IP hosts, and DECnet hosts. Additional machines outside the ICN are accessible through TCP/IP and DECnet. To access any of these machines, except for LIS, you must first establish an ICN account, which includes obtaining an ICN password and registering as an ICN user (contact the CIC Customer Service Center for details).*

*Example: Suppose you want to access the REGISTER machine from MICOM. By referring to the table, you can see that the appropriate command to enter is TIG. Once you connect to the TIG, enter your ICN user number and password as prompted. At the TIG prompt (tig>) enter register and login to the register machine.*

|                          |                                                                      |                                                                                           |
|--------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| TO →                     | Hosts reachable from MICOM Lines: (BETA, CANyon, CCVAX, TYMNET, LIS) | TCP/IP Hosts: (BETA, CCVAX, IBM Cluster, IOVAX, OFVAX, REGISTER, UNICOS, ACL Hosts, etc.) |
| FROM ↓                   |                                                                      |                                                                                           |
| MICOM Lines              | hostname                                                             | TIG<br>TELNET<br>hostname                                                                 |
| TCP/IP Hosts (e.g., TIG) | TELNET<br>MICOM<br>hostname                                          | TELNET<br>hostname                                                                        |

## Accessing the ICN through Dialup Modem

*Dialup access to the ICN is available through the Terminal Internet Gateway (TIG). The TIG is a gateway to the internet and allows you to telnet to ICN machines as well as other machines. Configure your modem and terminal for 8 bit, no parity, one stop bit. Based on your modem, select the appropriate number listed in the table to dial into the TIG. Then enter your ICN user number and password as prompted. At the TIG prompt (tig>) enter a machine name or IP address.*

*Report problems to the Network Control Center at 667-7423 Monday through Friday, 6 am to 6 pm or at 667-4585 during non-business hours.*

| Type of Access                                                         | Phone Numbers                                                                                        |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Microcom Modems from 300 to 28,800 b/s                                 | (505) 667-9020, 9021, 9022, 9023<br>(Number of Lines: 16)<br>(800) 443-1461<br>(Number of Lines: 10) |
| Microcom Modems from 300 to 14,400 b/s                                 | (505) 667- 9024 and 9025<br>(Number of Lines: 48)                                                    |
| Note: Use the next phone number if the first does not answer properly. |                                                                                                      |
| Revised August 1995                                                    |                                                                                                      |

# INTEGRATED COMPUTING NETWORK (ICN) VALIDATION REQUEST

**To access ICN Computing resources, please complete all parts of this form that apply to you, including "Special Requirements."**

**If you have questions:**

Call: (505) 665-1805  
E-mail: [validate@lanl.gov](mailto:validate@lanl.gov)

**Mail your completed application to:**

ICN Password Office (PWO)  
Mail Stop: B271  
Los Alamos National Laboratory  
Los Alamos, NM 87545

**All Laboratory computers, computing systems, and their associated communication systems are for official business only. By completing this request, users agree not to misuse the ICN. The Laboratory has the responsibility and authority to periodically audit user files.**

## Owner Information

|                            |                |                                                                            |
|----------------------------|----------------|----------------------------------------------------------------------------|
| Z-Number (if you have one) | PWO Use Only   | Name (last, first, middle initial)                                         |
| LANL Group                 | LANL Mail Stop | Citizenship (Foreign National see "Special Requirements-Foreign National") |
| Phone Number               | Cost Center    | Program Code                                                               |

|                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                           |                     |         |  |                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------|--|-----------------------|
| <b>Check LANL affiliation:</b><br><br><input type="checkbox"/> LANL employee<br><br><input type="checkbox"/> Contractor _____<br>(specify contract company)<br><br><input type="checkbox"/> Consultant, VSM, associate<br><br><input type="checkbox"/> External user _____<br>(specify employer)<br><br><input type="checkbox"/> Other (specify) _____ | <b>Send password / smartcard to:</b><br><br><input type="checkbox"/> Mail Stop      or <input type="checkbox"/> Mail to address indicated below<br><br><table border="1"><tr><td>Name / Organization</td></tr><tr><td>Address</td></tr><tr><td> </td></tr><tr><td>City, State, Zip Code</td></tr></table> | Name / Organization | Address |  | City, State, Zip Code |
| Name / Organization                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                           |                     |         |  |                       |
| Address                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                           |                     |         |  |                       |
|                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                           |                     |         |  |                       |
| City, State, Zip Code                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                           |                     |         |  |                       |

**Access** Check access method and needed partitions:

|                       |                                       |                                    |                               |
|-----------------------|---------------------------------------|------------------------------------|-------------------------------|
| <b>Access method:</b> | <input type="checkbox"/> ICN Password | <input type="checkbox"/> Smartcard | <input type="checkbox"/> Both |
|-----------------------|---------------------------------------|------------------------------------|-------------------------------|

☐ **Open** partition (e.g., email systems, open machines)

☐ **Administrative** partition (e.g., IA [BUCS, Stores, Travel], IB [EIS, FMIS, PAIRS] )  
 If you are not a Q-cleared LANL employee, see required steps in section "Special Requirements-Administrative Partition," unless you already have Administrative access with an ICN password.

☐ **Secure** partition (i.e., secure machines )  
 Indicate level(s) of data to be processed:
 

☐ Unclassified  
  
☐ Secret

I certify this person does require secure access:  
  

\_\_\_\_\_  
Manager Signature (Group Leader or above)
\_\_\_\_\_  
Date

**NOTE:** A Q-clearance is required. All classified computing must be performed within the Secure environment.

**PWO Use Only**

|                                                                                                              |                  |           |    |                    |
|--------------------------------------------------------------------------------------------------------------|------------------|-----------|----|--------------------|
| <div> <div>New</div> <div>Change</div> </div> <div> <input type="checkbox"/> <input type="checkbox"/> </div> | Clearance Status | Processed | Lv | Smartcard Serial # |
| Comments:                                                                                                    |                  |           |    |                    |

Form 1646 (1/95) Supersedes previous versions (rev. 1/25).

Continue 

## Special Requirements

|                                                      |                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Administrative Partition</b>                      |                                                                                                                                                                                                                                                                                                                                   |
| (U.S. Citizens Only)                                 | Lab-Wide Systems (e.g., IA [BUCS, Stores, Travel], IB [EIS, FMIS, PAIRS])                                                                                                                                                                                                                                                         |
| <input type="checkbox"/> Under 18 years of age       | If you need to access Administrative systems, your group leader must provide a memo accepting responsibility for your actions and justifying your need for access. This memo is to accompany all forms taken to the security briefing (see "Contractor or Non-Q-Cleared") section below. You may not access the Secure Partition. |
| <input type="checkbox"/> Contractor or Non-Q-Cleared | Phone (505) 667-9444 to obtain Access Authorization packet.<br>Phone (505) 667-9153 to schedule a security briefing.<br>Bring all forms including this ICN Validation Request to the security briefing for approval.                                                                                                              |
| Security Briefing Approval Signature                 | Date                                                                                                                                                                                                                                                                                                                              |

|                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Foreign National                                                                                                                                                                                                                                                                                                                            |
| Attach a copy of Form 982 (REQUEST FOR UNCLASSIFIED VISIT OR ASSIGNMENT BY A FOREIGN NATIONAL) with all approval signatures. Be sure Box #11 of Form 982 is completed. If you are not a visitor/assignee under a LANL/DOE approved Visit / Assignment Request, attach written justification from your host Division Director describing your need to access the ICN. |

## Authorization (required)

|                                            |                  |       |
|--------------------------------------------|------------------|-------|
| Print Manager Name (Group Leader or above) | Manager Z-Number | Group |
| Manager Signature (Group Leader or above)  | Mail Stop        | Date  |

If you are NOT a LANL employee, obtain your LANL contact's signature in addition to the contact's manager's signature.

NOTE: LANL contacts are regular Laboratory employees. Contacts are responsible for obtaining annual re-authorizations, forwarding renewals, and notifying the ICN Password Office of changes in user or contact status.

|                         |                  |              |       |
|-------------------------|------------------|--------------|-------|
| Print LANL Contact Name | Contact Z-Number | Phone Number | Group |
| LANL Contact Signature  | Mail Stop        | Date         |       |

## Reader Feedback

Feedback helps us to provide a document that responds to the changing needs of its readership. If you have comments or questions about this publication, please let us hear from you. We have reserved the back of this form for that purpose. We also accept articles for publication that are of interest to our readers. Contact the managing editor for more information. This form is also used for new subscriptions, deletions, or changes. Instructions are on the back. If you prefer to contact us by E-mail, send your comments and/or subscription request to [finney@lanl.gov](mailto:finney@lanl.gov).

Do Not Staple  
Fold on This Line First



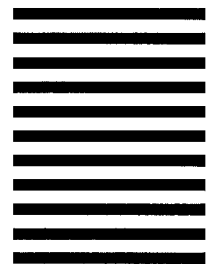
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